School-based problem-solving interventions: the impact of training and documentation on the quality and outcomes

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School-based problem-solving interventions:
The impact of training and documentation on the quality and outcomes

by

Kristi R. Flugum Upah

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Psychology
Major Professor: Daniel J. Reschly

Iowa State University
Ames, Iowa
1998

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ABSTRACT

Limited research suggests there is a relation between quality interventions, as indicated by the presence of specific indicators, and positive student outcomes (Flugum, 1992; Flugum & Reschly, 1992, 1994); these findings, however, were based on self-report data with no intervention documentation to verify the quality or outcomes. There continues to be a need to determine which components (i.e., quality indices) are essential for school-based problem-solving interventions to result in positive outcomes for students. Research (e.g., McDougall, Reschly & Corkery, 1988; Kratochwill, VanSomeren & Sheridan, 1989) also supports the use of protocol-based training to influence the quality of these interventions positively; yet, questions remain as to the effect of the protocol versus the training.

In addition to answering the above question, this study attempted to overcome the weaknesses of previous research on quality indicators of interventions and validate recommended “best practice” (i.e., Tilly & Flugum, 1995). This study also contributed to the research on the efficacy of school-based problem solving by examining the impact of intervention quality indicators on student outcomes. Specific research questions addressed are (a) Does training in designing and implementing interventions increase the quality of the intervention? (b) Do the intervention documentation materials used influence the quality of the intervention? (c) Is there a positive relation between the quality of the intervention and the outcome of the intervention?

Results support the use of protocol-based training in improving intervention quality and validate recommended “best practice” in designing and implementing quality interventions. Training in designing and implementing interventions which incorporated an intervention documentation protocol outlining quality indices resulted in higher quality interventions than those designed and implemented prior to the training. The “protocol-based” aspect of the training may have been the critical piece, since the use of the intervention documentation protocol alone resulted in improvements equal to those attained with the protocol and
training. Those interventions with higher levels of quality were related to more positive student outcomes.
INTRODUCTION

A primary focus of educational reform is to implement changes in the traditional service delivery system to provide better services to all students (Graden, Zins, & Curtis, 1988; Reschly, 1988; Reschly & Ysseldyke, 1995). Delivery system reforms shift professionals' emphasis from diagnosis and classification procedures to intervention design, implementation, and evaluation; expand educational options for students; and base educational decisions on student outcomes (Reschly, 1988). The term "problem solving" is often used to describe this change in service. Currently, however, there is relatively little data as to the effectiveness of this system and even less as to the quality of the individualized interventions designed and implemented.

One of the greatest concerns with the traditional system of practice, as well as the shift towards problem solving, is the quality of interventions (Flugum, 1992; Flugum & Reschly, 1992, 1994; Gresham, Gansle, Noell, Cohen, & Rosenblum, 1993). In examining the quality and outcomes of services provided to students referred for special education but not placed, Flugum found that the majority of these students are not receiving quality interventions that result in positive student outcomes. Yet, a relation between quality interventions and positive student outcomes was found with those interventions implementing more quality indicators (i.e., behavioral definition, baseline data, intervention plan, treatment integrity, graphing, and pre-post comparison of data) being more successful. These conclusions, however, were based on self-report data from general education teachers and support staff; no permanent products were gathered to verify the use of such quality indicators.

Other studies have examined the relation between specific intervention components and outcomes (e.g., Bergan & Tombari, 1976; Fuchs & Fuchs, 1986; Gresham et al., 1993). There is no empirical data, however, as to the efficacy of the component package recently identified by Tilly and Flugum (1995) as "best practice"—behavioral definition, baseline
data, problem validation, functional analysis, goals, intervention plan, treatment integrity, progress monitoring, and program evaluation.

Research has shown that continuing education in protocol-based problem solving improves the quality of interventions (Kratochwill, VanSomeren, & Sheridan, 1989; McDougall, Reschly, & Corkery, 1988). These studies, however, focused on the presence of general problem-solving components, not the level of quality and to the specificity recommended as "best practice" by Tilly and Flugum (1995). In addition, no information exists as to the impact of the training compared to the protocol itself on intervention quality and outcomes.

This study will examine the validity of best practices in intervention design and implementation using objective, permanent product indices of intervention quality. In addition, it will assess the effect of a protocol and training on intervention quality and outcomes.
REVIEW OF RELATED LITERATURE

To set a stage for school-based problem-solving interventions, a review of some problem-solving models will be presented. The literature that has identified and supported quality indicators of interventions also will be examined. In addition, research examining the presence of quality indicators and their relation to positive outcomes for students will be discussed.

Problem Solving

Problem solving refers to a systematic approach used to conceptualize a problem situation, identify needs, design strategies to meet those needs, and implement and evaluate the strategies (Allen & Graden, 1995). Many of these systematic approaches were initially introduced as consultative models—behavioral consultation (Bergan, 1977; Bergan & Kratochwill, 1990), collaborative consultation (Idol & West, 1987), collaborative problem-solving consultation (Gutkin & Curtis, 1990), Referral Question Consultation (RQC: Batsche & Ulman, 1983; Batsche & Knoff, 1995), and instructional consultation (Rosenfield, 1987). Regardless of which model is selected, all these problem-solving approaches have common features involving problem definition, direct measurement of behaviors, intervention design, progress monitoring with intervention revisions as necessary, and outcomes evaluation (Reschly & Ysseldyke, 1995).

It is important to remember that problem solving is not a term or a process reserved for activities focused on atypical development; it is an approach to developing interventions rather than determining failure or deviance (Deno, 1995). Stated more strongly, systematic problem solving—consisting of problem identification, goal setting, essential pre-intervention data collection, and progress monitoring—is considered critical for providing effective interventions for students (Fuchs, 1991). Two specific problem-solving models—behavioral consultation and Heartland Area Education Agency's service delivery model—will be discussed further.
Behavioral Consultation

As suggested above, there are several problem-solving models. Bergan's Behavioral Consultation model (Bergan, 1977; Bergan & Kratochwill, 1990; Kratochwill & Bergan, 1990) is one of the best known models in the school psychology literature. Within this model, consultative problem solving is conducted within a series of four interrelated stages: Problem Identification, Problem Analysis, Plan Implementation, and Problem Evaluation. Consultants guide consultees (e.g., teachers or parents) through the majority of these stages in a succession of structured interviews with specific objectives, with the hope of attaining two goals: (a) changing student behavior, and (b) changing consultee behavior in relation to the student and in relation to future students. Specifically, behavioral consultation is a problem-solving model designed to assist teachers in defining student problems, measuring the extent of the problem and relating it to environmental events, formulating and implementing interventions to resolve the problem, and evaluating the effectiveness of the intervention plan.

Several studies by D. Fuchs and his colleagues (i.e., Fuchs, 1991; Fuchs & Fuchs, 1989; Fuchs, Fuchs, & Bahr, 1990; Fuchs, Fuchs, Bahr, Fernstrom, & Stecker, 1990), developed an effective approach to pre-referral interventions through the use of a four-stage problem-solving approach similar to Bergan and Kratochwill's (1990) Behavioral Consultation. The problem-solving approach consisted of four stages that refer to potential indicators of quality interventions: (a) Problem identification, where the problem is defined in observable terms and directly measured; (b) Problem analysis consisting of validating the existence of a problem, identifying instructional and student variables that may contribute to a solution, and collaboratively developing a systematic plan; (c) Plan implementation involving implementation of the plan as intended, continuous monitoring of progress, and change within the plan if necessary; and (d) Problem evaluation, where the effectiveness of
the intervention is evaluated and, if it has been ineffective, modifications of the plan are designed.

These investigations (Fuchs, 1991; Fuchs & Fuchs, 1989; Fuchs, Fuchs, & Bahr, 1990; Fuchs et al., 1990) assessed the effects of three increasingly inclusive versions of the Behavioral Consultation model on student outcomes. The three versions, from least inclusive to most inclusive, were (a) the first two stages—Problem Identification and Problem Analysis only, (b) the first three stages—Problem Identification, Problem Analysis, and Plan Implementation, and (c) the entire model—Problem Identification, Problem Analysis, Plan Implementation, and Problem Evaluation. Preintervention and postintervention teacher ratings and direct observations of student behavior indicated that more inclusive versions were more effective than the least inclusive model in reducing problem behavior. Their research would suggest all four components are critical for positive student outcomes (Fuchs, Fuchs, & Bahr, 1990; Fuchs et al., 1990).

**Heartland Area Education Agency's Service Delivery System**

A problem-solving model developed by Heartland Area Education Agency 11 in central Iowa has been implemented for several years. Due to the direct application to this study, this model will be discussed further. Heartland Area Education Agency 11 in Iowa developed a four-stage problem-solving alternative service delivery system (Heartland Area Education Agency, 1994). The four levels of problem solving involve different degrees of intensity and different levels of special education and support services involvement. Figure 1 illustrates the four levels of the problem-solving model.

The first two levels are conceived as occurring entirely within general education with occasional involvement of support services providers (i.e., school psychologists, educational consultants, school social workers). Level I problem solving is the course of action taken by the classroom teacher and parent(s) when a student's performance is different in some way from the performance of others in the classroom. If the interventions and
accommodations developed during Level I do not result in remediation of the concern, additional assistance may be requested from the Building Assistance Team, support and instructional personnel, or other community resources. This additional assistance describes Level II of the problem-solving model.

Figure 1. Heartland Area Education Agency Problem-Solving Model
If Level II interventions have not been sufficient to match the intensity of the problem or if additional resources (i.e., Heartland Area Education Agency support staff) are needed to solve the problem, the process moves to an extended problem-solving team (Level III). In Level IV problem solving, classification of the student as needing special education services may be considered based on documentation of (a) substantial discrepancies from typical classroom performance not resolved sufficiently by high quality interventions in general education, or (b) behavioral discrepancies requiring program elements or instructional intensity beyond resources that reasonably can be provided in general education.

Level III is the critical component to this study. Level III problem solving, involving support services personnel such as school psychologists or educational consultants, is a rigorous, data-driven, intervention effort that must meet specific criteria. An extended problem-solving configuration was developed for staff to follow in providing intervention services to students (see Appendix A). This model consists of five components:

1. **Problem statement** — the problem statement contains a specific, observable and measurable target behavior; in addition, behavior dimensions and degree of discrepancy based on local standards are specified.

2. **Systematic data collection** — multi-dimensional assessment procedures are used to collect problem-centered data that provide a quantitative and qualitative description of a discrepancy, examine alterable factors in four domains, and design a specific individualized intervention.

3. **Intervention action plan** — this plan has internal consistency, specific objectives, implementation steps, and a progress monitoring plan.

4. **Implementation of intervention plan** — the plan is implemented as designed with planned, ongoing trouble shooting; decisions are made on data that are gathered regularly and frequently.
5. **Parent involvement** – parent(s) is invited to participate at all decision-making points with documentation of their involvement.

Interventions meeting these components must be implemented for a reasonable period of time and found to be insufficient according to progress monitoring data or unreasonable to be maintained over time without additional resources before Level IV problem solving is initiated. To date, there is no empirical data as to the efficacy of Level III problem-solving interventions in regard to student progress or the number of students who proceed to Level IV-Determination of Special Education Entitlement.

**Interventions**

As has been stated repeatedly, interventions are an essential feature of alternative service delivery systems and educational reform in an effort to meet the needs of all students (Graden, Zins, & Curtis, 1988; Stoner, Shinn, & Walker, 1991). In addition to meeting the needs of students in the most inclusive setting (i.e., general education) (Reschly, 1988), response or resistance to intervention is a critical special-education eligibility criterion (Gresham, 1991). Lentz, Allen and Ehrhardt (1996) define an intervention as “doing something different to solve some perceived problem” (p. 120). Yet, most authors have neglected to define what is meant by "intervention."

Tilly and Flugum (1995) recognized this frequent omission and defined "intervention" as a planned modification of the environment made for the purpose of altering behavior in a pre-specified way. Emphasis was placed on three components of this definition: (a) planned – the procedures to be applied are specified clearly and completely; (b) environmentally focused – the actions taken modify the environment, not the individual; and (c) goal directed – the behavior is altered in a pre-specified way. This definition sets a clear foundation from which to build specific quality indicators of interventions. Limited research has found high quality interventions have significant promise for improving the performance of students in general education classrooms, thereby preventing unnecessary referrals and evaluations and
allowing each student's needs to be met in the least restrictive environment (Flugum, 1992; Flugum & Reschly, 1992, 1994).

**Quality Indicators Of Interventions**

Quality indices of interventions have been specified in the behavioral literature for over 25 years (i.e., Baer, Wolf, & Risley, 1968; Bijou, 1970). Since then many others have identified components of interventions or models of problem-solving that reflect quality indices. Bergan and Kratochwill's (1990) Behavioral Consultation model described previously is an example of a problem-solving model that identifies intervention components within four stages: Problem Identification, Problem Analysis, Plan Implementation, and Problem Evaluation.

Another example is Reynolds, Gutkin, Elliott, and Witt's (1984) intervention model. Reynolds et al. developed a 13-staged intervention flowchart in which some of the stages referred to the quality of the intervention. The stages were (a) Define the problem; (b) Specify the goals of the intervention; (c) Are the goals realistic?; (d) Collect data; (e) Does the data support the problem definition?; (f) Formulate and implement the intervention; (g) Is the intervention acceptable to all involved?; (h) Maintain treatment integrity; (i) Assess the change; (j) Was the intervention effective?; (k) Was the intervention cost-effective/beneficial?; and (l) Disseminate.

A performance monitoring system suggested by Schendel and Ulman (1989) can also be used to identify components of an effective intervention. These steps were (a) Behaviorally define the activity to be monitored in a concrete and observable manner; (b) Develop a measurement strategy which defines how the performance data will be collected; (c) Describe the student's current level of functioning by providing a baseline; (d) Develop an intervention that is designed to improve the student's performance; (e) Develop a goal statement that defines the desired change in the student's performance; (f) Graph the student's current level
of functioning, the performance goal, and the actual student performance over time; and (g)
Establish a decision-making plan for evaluating the performance trends of the student.

In examining the relation between quality interventions and student outcomes, Flugum
(1992) and Flugum and Reschly (1992, 1994) addressed six quality indices: (a) a behavioral
definition of the target behavior; (b) a direct measure of the student's behavior in the natural
setting prior to intervention implementation (baseline data); (c) a step-by-step, or systematic,
intervention plan; (d) implementation of the intervention as planned (treatment integrity); (e)
graphing of intervention results; and (f) direct comparison of the student's post-intervention
performance to baseline data.

Tilly and Flugum (1995) proposed a nine-component model as a best practice standard
for the development and documentation of educational interventions. In addition to the six
quality indicators presented by Flugum and Reschly (1994), four other problem-solving
components were identified. These indicators were (a) systematic problem validation, (b)
functional analysis of the problem, (c) goal setting, and (d) systematic formative evaluation
of program effects (this step was combined with Flugum and Reschly's "direct comparison
of post-intervention performance to baseline" to become "formative and summative
evaluation"). The authors also presented a flowchart (see Appendix B), case study, and
intervention documentation protocol (see Appendix C) to better depict these components and
their use in a quality intervention.

The quality indices addressed in this study are taken from Tilly and Flugum (1995).
This article appears to be the most comprehensive summarization of problem-solving
components to date including information from psychology, special education, school
psychology, and problem-solving literature. Thus, the nine-components to be further
developed include: (a) behavioral definition of the problem, (b) baseline data, (c) problem
validation, (d) functional analysis of the problem, (e) goal setting, (f) intervention plan, (g)
treatment integrity, (h) progress monitoring, and (i) program evaluation. It should be noted,
however, that few authors have empirically evaluated the impact of these indices, individually or in combination, on student outcomes.

**Behavioral definition.** Behaviors that are the subject of interventions must be described in specific, observable, and measurable terms (Alberto & Troutman, 1986). This process is called operationally defining a behavior. The importance of a behavioral definition has been emphasized for nearly three decades (e.g., Baer et al., 1968; Bijou, 1970). Twenty years later, Baer, Wolf, & Risley (1987) continued to support defining the behavior in observable, quantifiable terms. Other authors (e.g., Deno, 1995; Grimes, 1981; Reynolds et al., 1984; Steege & Wacker, 1995) have recognized how essential an accurate behavioral definition is to the success of the intervention. A behavioral definition of the problem ensures that all involved persons will share a common understanding of when the behavior is or is not occurring. As a result, operationalized definitions of student behavior allow for a reliable measurement of outcomes (Kazdin, 1982; Steege & Wacker).

An operational definition must meet three criteria: (a) **objective** – the definition should refer to observable characteristics of behavior or environmental events; (b) **clear** – the definition should be so unambiguous that it could be read, repeated, and paraphrased by observers; and (c) **complete** – the definition should delineate both examples and non-examples of the behavior so that differences between occurrences and non-occurrences of the behavior can be discerned (Hawkins & Dobes, 1977; Kazdin, 1982). To write behavioral definitions meeting these criteria, it may be helpful to use a standard format. Tilly and Flugum (1995) presented a format that is particularly useful:

*Target behavior* means that *Target student* (*Action verbs*). Examples of

*Target behavior* include (1)...., (2)...., (3)....

Non-examples of *Target behavior* include (1)...., (2)...., (3)....

This format requires that attention is directed at what an individual actually does when performing the behavior providing a vehicle for efficient writing of definitions.
Baseline data. Measurement of the target behavior in the natural setting prior to plan implementation is essential to interventions (Casey, Skiba, & Algozzine, 1988). The establishment of the student's current level of functioning provides a baseline that is useful in evaluating the existence of the problem behavior, the effectiveness of the intervention, and the degree of student progress (Reynolds et al., 1984; Schendel & Ulman, 1989; Sulzer-Azaroff & Mayer, 1991). The baseline data component involves three steps: (a) establishing the relevant dimension(s) of the problem behavior, (b) developing a method to systematically measure the behavior, and (c) collecting data on the behavior prior to implementing an intervention (Tilly & Flugum, 1995).

When identifying the appropriate dimensions of the target behavior, FLIT AD is a useful acronym to remember (Tilly & Flugum, 1995). FLIT AD stands for the possible dimensions of the behavior that may be problematic: (a) frequency—the number of times a behavior occurs, (b) latency—the elapsed time from the presentation of a stimulus and the response or behavior, (c) intensity—the strength or force with which a behavior is expressed, (d) topography—the configuration, form or shape of a response or behavior, (e) accuracy—the extent to which the behavior meets standards or is correct, and (f) duration—the length of time that passes from onset to offset of a behavior (Sulzer-Azaroff & Mayer, 1991).

In designing the measurement strategy, there are three important points to consider. First, the behavior must be measured directly in the setting where it is perceived to be problematic. Second, the measurement strategy used to collect information should be accurate, objective, and related directly to the relevant dimension of the behavior. Third, this same strategy will be used throughout the intervention to monitor and evaluate its effectiveness at improving student performance (Tilly & Flugum, 1995).

Baseline data collection should consist of repeated measures of the target behavior over several sessions, days, or even weeks, until a stable range of behavior has been identified (e.g., no new highs or lows for three data points in a row [Sulzer-Azaroff & Mayer, 1991]).
Collection of baseline data serves several purposes related to other intervention components. Describing the characteristics of the student's performance (e.g., variability, trend in behavior), scaling the magnitude of the problem, and documenting pre-treatment levels of behavior provides needed information for validating the problem and later evaluating the program. Current performance provides data for predicting future performance in the absence of intervention thus setting standards for goals and evaluation. An opportunity to observe relationships between the problem behavior and other environmental variables provides critical information useful during functional analysis and intervention design.

Problem validation. A practical method in defining a problem is to conceptualize the problem as the difference between what is expected in an environment and what actually occurs (Deno, 1995; Tilly & Flugum, 1995). This discrepancy also helps in validating the problem.

In practice, a discrepancy is determined by comparing an individual's current level of performance, documented using baseline data, to a standard representing acceptable performance. A very useful standard for both academic and social-emotional behaviors is based on typical peer performance. This standard is obtained by measuring typical peers' performance on the behavior of concern to find a range of typical performance (Tilly & Flugum, 1995). Other performance standards could include "expert judgment" (i.e., teacher expectations, instructional placement standards), norms (i.e., local CBM norms, developmental norms), and anticipated expectations of a future environment (e.g., the next grade level).

Two questions should be asked when validating a problem (Schendel & Ulman, 1989; Tilly & Flugum, 1995). First, is there a discrepancy between the target student's performance and the performance standard? Second, if a discrepancy exists, is it large enough to warrant intervention? If the answer to either of these questions is no, then the existence of or severity of the problem should be questioned and possibly re-examined. If
the answer to both of these questions is yes, then the problem is validated and further assessment for the purpose of developing and evaluating interventions is needed.

**Functional analysis.** As mentioned above, the next step is to conduct further assessment for the purpose of designing, implementing, and evaluating interventions. Many authors (e.g., Batsche & Knoff, 1995; Sulzer-Azaroff & Mayer, 1991; Vollmer & Northup, 1996) recommend the use of functional analysis to provide the information necessary to design interventions. In fact, the *Journal of Applied Behavior Analysis* recently devoted two entire issues to the topic of functional analysis (1994, Volume 27, Number 1-2) and *School Psychology Quarterly* devoted an issue to the topic of applied behavior analysis (1997, Volume 12, Number 1). Functional analysis identifies factors influencing or controlling the target behavior (Shapiro & Kratochwill, 1988). More importantly, functional analysis provides the critical link between assessment information and intervention procedures.

Functional analysis is a scientific method designed to discover the functional relation between the problem behavior and the variables that influence or control it. Functional analysis is more than the gathering of information—it is using that information to develop an appropriate intervention to solve the problem. For non-academic concerns, there are several methods that can be used in conducting a functional analysis. Some such methods include (a) the sequence or ABC model developed by Reese, Howard, and Reese (1977)—events described in a narrative recording of a behavior observation are organized and categorized as sequences of antecedents, behaviors, and consequences; (b) the scatterplot method described by Touchette, MacDonald, and Langer (1985)—behavior is observed using frequency counts in specified time intervals attempting to display periods during which the behavior virtually never occurs or occurs with near certainty; and (c) the SORKC model expanded by Kanfer and Phillips (1970)—observations are made of the stimulus in the environment (S), organismic variables influencing the behavior (O), the response or behavior itself (R), the contingencies or rules of reinforcement specifying the relation between the environment,
behavior, and consequences (K), and the consequences functionally related to the behavior (C). For academic concerns, Curriculum-Based Evaluation (CBE; Howell, Fox & Morehead, 1993)—a functional evaluation using specific procedures and techniques to provide information for educational decision making—can be likened to a functional analysis.

In choosing an assessment method(s), it is important to keep in mind that alterable factors from a variety of domains be examined—Instruction and Curriculum issues, Environmental settings and demands, and Learner characteristics (ICEL). This information should also be gathered from a variety of sources—Review, Interview, Observe and Test (RIOT). The RIOT-ICEL matrix is useful in ensuring assessment information has been gathered from multiple sources across a variety of domains (Heartland Area Education Agency, 1995).

**Goals.** In the absence of a clearly articulated goal, the effectiveness of interventions can become obscured. In other words, if we don't know where we are going, how will we know when we get there? Clearly written, justifiable goals and procedures for evaluating goal attainment are key factors to successful programs (Cobb, 1995; Fuchs, 1995). There are three critical purposes for developing goals: (a) the teaching and intervention are directed, (b) the plan is focused on student outcomes, and (c) the methods for assessment and evaluation are structured (Fuchs).

Goals are general statements about the behavior targeted for change and the direction or level that change should take (Sulzer-Azaroff & Mayer, 1991). Effective goals must be ambitious and focused on long-term outcomes (Fuchs, 1995). Three standards for setting performance levels include (a) interindividual norms, (b) intraindividual norms, and (c) the student's own performance over time (Fuchs). Logically, the standard used to set the goal would be related to the standard previously used to identify the discrepancy during problem validation.
Goal statements are based on the problem behavior(s) and should state clearly, in a measurable way, what the individual’s performance will look like if the intervention is successful. Every goal must include three components (Howell, Fox, & Morehead, 1993; Schendel & Ulman, 1989): (a) conditions—the specific circumstances under which the behavior is to occur; (b) behavior—the specific behavioral description of the task to be performed; and (c) criteria—the standard of how well (e.g., how accurately, how frequently, how quickly) the behavior is performed. In most circumstances, a goal statement can both be stated narratively and be represented graphically on a performance chart. For the narrative statement, it may be helpful to use a standard format. Tilly and Flugum (1995) presented a format often used for stating goals:

In number weeks, when condition occurs, learner will behavior (to a) criterion.

Intervention plan. The intervention plan answers questions relevant to solving the identified problem, including, who will do what, when they will do it, where the plan will be implemented, how the steps will be completed, and with whom the plan will be implemented (Macmann et al., 1996; Tilly & Flugum, 1995). This plan ensures all parties involved with the intervention share the same understanding of the procedures that will be used, serves as a guide for implementors of interventions, and serves as a record of the intervention. A written step-by-step plan also allows for greater reliability in determining the level of treatment integrity (see next section). Just as an operational definition completely describes a behavior of concern, an intervention plan clearly describes the procedures to be used during an intervention. Indeed, an intervention plan should be clear enough that a trained reader could replicate the intervention and produce the same results (Baer et al., 1968). Generic descriptions of an intervention (e.g., "social skills training," "differential reinforcement of other behavior – DRO") are not adequate for intervention plans (Telzrow, 1995).
Schendel and Ulman (1989) identified a series of components that should be included in a written intervention plan. For academic behavior, the intervention plan should define specific teaching procedures, physical arrangements, the time allotted to each teaching activity, the materials to be used in instruction, and motivational strategies to be employed. For non-academic behaviors the intervention plan should describe the settings where the intervention will occur, motivational strategies, specific behavior management procedures, and instructional strategies.

Similarly, Batsche and Knoff (1995) suggested an intervention plan include four components: (a) assessment outcomes, (b) intervention strategies—very specific, "how-to-do-it" guidelines designed to improve the behaviors or problems relevant to the referral concern, (c) expected outcomes and definitions of success—criteria, which behaviors, how long, and (d) personnel responsible.

A final component in a written intervention plan is a statement of how decisions will be made. This component describes strategies that will be used for data collection, summarization, and evaluation (Ross, 1995). Tilly and Flugum (1995) identified four specific issues to be addressed: (a) frequency of data collection, (b) what strategies will be used to summarize data for evaluation, (c) how many data points or how much time should occur before data will be analyzed, and (d) a decision rule (i.e., a statement describing the actions that will be taken by intervention agents based on the intervention data).

**Treatment integrity.** The intervention needs to be implemented as planned in order to determine if the intervention is effective. The degree to which the intervention is implemented as planned is often called "treatment integrity" (Gresham, 1989; Telzrow, 1995; Yeaton & Sechrest, 1981). Several authors (e.g., Elliott, Witt, & Kratochwill, 1991; Fuchs & Fuchs, 1989; Lentz, Allen & Ehrhardt, 1996; Reynolds et al., 1984; Taylor & Miller, 1997) have recognized the importance of treatment integrity in the implementation of an intervention. Few studies in the behavioral literature, however, have assessed the treatment
integrity of the interventions examined (Elliott et al.; Gresham, Gansle, & Noell, 1993; Gresham et al., 1993; Peterson, Hommer, & Wonderlich, 1982).

There are a number of different approaches that can be used to assess treatment integrity. A teacher or parent may be interviewed regarding the steps followed during intervention (Kaufman & Flicek, 1995). Direct observation of teacher or parent behavior could be conducted occasionally throughout the intervention implementation to assess whether the steps are being carried out as planned (Gresham et al., 1993). Or the written step-by-step intervention plan could be used as a checklist; every time the intervention was implemented the teacher or parent would complete the checklist to determine the steps that were followed (Gresham, 1989). The important component in assessing treatment integrity is determining the extent to which intervention procedures were implemented as intended.

Without at least occasional treatment integrity checks, one cannot be sure that the intervention is being applied as designed (DuPaul & Stoner, 1994). If the intervention is not implemented as designed, progress (or lack thereof) cannot be attributed to the specific plan. It is a matter of internal validity—regardless of size of effect, one cannot conclude that changes in the dependent variable(s) (i.e., student behavior) can be attributed to the influence of the independent variable (i.e., intervention) if it has not been determined that the intervention was implemented as intended. That is, practitioners who fail to monitor the consistency and accuracy with which interventions are implemented cannot validly attribute a student's behavioral improvements (or failure to improve) to the behavioral interventions implemented (Kaufman & Flicek, 1995).

Progress monitoring. Progress monitoring is a primary ingredient in a problem-solving approach (Marston & Tindal, 1995; Shinn, 1989). Throughout intervention implementation, student performance should be assessed so continuous evaluation can occur and interventions may be modified as needed. Carter and Sugai (1989) suggested that the most reliable way to evaluate an intervention is through frequent and repeated monitoring
(e.g., one to three times per week) of the target behavior. Data are collected across time on
the behavior that was identified during problem identification. These data can be used to
create a graphic display for the purpose of illustrating trends in student performance by
repeatedly plotting the problematic dimension (i.e., FLITAD) of student behaviors.
Graphing the student's performance enables the intervenor to detect slight changes in
behavior that otherwise might not be recognized (Casey et al., 1988).

Lovitt (1991) briefly explained 19 general ways to acquire monitoring data. Those
procedures are the following: frequency count, percent, duration or latency, interval
recording, rating scale, checklist, before-during-after observations, sociometric ratings,
interviews, free expression, written items from a pool, written items that are different,
construct, cloze procedures, video recording, audio recording, computer-assisted evaluation,
interaction analysis, contrived situations. Two specific practices are curriculum-based
measurement (CBM; Shinn, 1989) and goal-attainment scaling (GAS: Fuchs, 1995;
Kratochwill, Busse, Ruffalo, & Elliott, 1995).

It is important to gather data because it is possible to be fooled about program effects.
Without proper data, it is possible to believe that an intervention is assisting the student to
achieve some goal, when in fact it is not. It is also possible that the student is actually
progressing toward some objective, but without the help of data it is believed otherwise
(Lovitt, 1991). Simply collecting the data for the sake of collecting data, however, is not
enough—it needs to be used in the decision-making process (Tawney & Gast, 1984).
Unfortunately, people collect data on the existence of a problem and then monitor progress
toward goals, but they tend not to use the data to make timely changes in unsuccessful
interventions (Deno, 1995).

Tilly and Flugum (1995) recognize that visual representation of performance using
graphs is but one means for summarizing and evaluating data. The authors suggest graphs
are useful for at least three purposes. First, they provide a means of visually summarizing
information about student performance, for example current levels of performance, projected performance (a performance goal), and actual performance as it changes over the course of intervention. Second, graphing of results during monitoring may have an important impact on inferences made about the intervention effectiveness and student progress (Skiba, Deno, Marston, & Casey, 1989). For example, “When parents, teachers, and other agents can see visual evidence (i.e., a graph) that a procedure is bringing about the desired change, they are likely to find the evidence reinforcing. Such reinforcement helps to maintain the participation of those people in the treatment program, which is critical if objectives are to be achieved.” (Sulzer-Azaroff & Mayer, 1991, p.128). Third, graphing of student performance provides a measure of professional accountability demonstrating how behavior change is functionally related to the intervention being implemented.

For clarity of communication, a standard format should be used for graphs (e.g., Parsonson & Baer, 1978; Sulzer-Azaroff & Mayer, 1991). When a standard format is followed, additional advantages are to be gained through the use of graphs: (a) they provide a visual that yields quick conclusions and hypotheses; (b) they are quick and easy to make; (c) they can be presented in a wide range of formats with a variety of data types; (d) the messages are immediate, enduring, and accessible to students; (e) there is minimal transfer of data; and (f) the theoretical premises underlying graphs are minimal and well known (Parsonson & Baer, 1992).

**Program evaluation.** Two types of data evaluation should be conducted for every intervention: formative and summative. Formative evaluation occurs throughout the implementation of an intervention. The purpose of formative evaluation is to determine the likely success of an intervention during its implementation so that it can be modified or changed to increase the likelihood that intended results will be achieved. In most cases, effectiveness is evaluated by examining trends in performance data during the implementation of the intervention and comparing these trends to the baseline data collected
prior to the intervention (Tilly & Flugum, 1995). The most probable explanation for this increased intervention success when progress monitoring occurs is that the empirical records of intervention effects are continuously available for use in deciding whether a program is producing intended effects and should be continued, or is ineffective and should be modified or abandoned (Deno, 1995).

Summative data evaluation typically occurs after an intervention has been completed. The purpose of summative evaluation is to determine whether the intervention was successful and produced positive student outcomes. One systematic method of determining the effect(s) of an intervention program is to directly compare baseline performance to post-intervention performance (Flugum & Reschly, 1994). This comparison makes it possible to determine whether the goal has been reached. In addition, it is recommended that data continue to be collected periodically to determine whether the progress is maintained once the intervention is removed (Casey et al., 1988).

There are three advantages to evaluating the effectiveness of interventions (Steege & Wacker, 1995). First, the more precise and thorough we are in our evaluation procedures, the more information we will obtain about students. Second, by evaluating interventions across target behaviors, students, teachers, parents, and settings, a wide repertoire of potentially useful interventions will be identified. Third, ongoing monitoring of students' performance during the delivery of an intervention allows one to identify specific procedural difficulties and to make necessary modifications to intervention components, thereby increasing the effectiveness of the intervention package.

Outcomes

Greater attention to documentation of outcomes is pervasive in both general and special education (Ysseldyke, Thurlow, & Bruininks, 1992). The paradigm of schooling is subtly but surely changing from an emphasis on the resources and inputs of education to accountability for the outcomes and achievement levels attained by students (Cobb, 1995).
As a result, a common question being asked is, "Did the student improve with intervention?" or stated differently, "Following intervention, did the behaviors targeted for intervention change in the desired direction?" (Steege & Wacker, 1995). Some of the quality indicators previously discussed directly help one to answer these questions (i.e., baseline data, progress monitoring, and program evaluation). It also has been suggested that other specific quality components will ensure a "yes" to these questions; however, there is limited research to support this hypothesis (Flugum, 1992; Flugum & Reschly, 1992, 1994).

**Relation Between Quality Indicators And Intervention Outcomes**

While many authors have proposed problem-solving models or individual intervention components that may directly influence student outcomes, few have empirically evaluated that relation. Nearly 30 years ago, in evaluating components of the Behavioral Consultation model, Bergan and Tombari (1976) found that when problem situations are defined in observable, operational terms, the probability of successful problem resolution is significantly higher ($R = .77$). Since then most of the research has focused on treatment integrity, progress monitoring, and program evaluation.

**Treatment integrity.** In reviewing experimental studies published between 1980 and 1990 that involved child-based, school setting interventions, Gresham et al. (1993) found a moderately positive relation between degree of treatment integrity and level of student outcome. Those interventions reporting a higher percentage of treatment integrity had greater degrees of behavior change ($r = .51$ between effect size and percent treatment integrity; $r = .58$ between percentage of nonoverlapping data points and percent treatment integrity).

Kaufman and Flicek (1995) used two measures of treatment integrity: (a) a single-item teacher rating of an intervention's overall integrity on a daily basis; and (b) a semi-structured interview conducted by the school psychologist at periodic behavior plan "follow-up meetings" with the classroom teacher and the student's parents. The authors found a moderate, positive relationship ($r = .52$) between the effectiveness of the intervention, as
indicated by teacher ratings, and the degree of the integrity with which they were implemented. It also demonstrated that use of indirect measures is feasible on a daily, weekly, and periodic basis to collect useful treatment integrity data.

**Progress monitoring and program evaluation.** Research indicates that frequent progress monitoring and formative evaluation (i.e., using the monitoring data in decision making) can enhance student outcomes (e.g., Fuchs, Deno, & Mirkin, 1984; Fuchs, Fuchs, Hamlett, & Stecker, 1991). In addition, program reforms are more successful when systematic data-decision rules have been used to make program improvement decisions (Fuchs & Fuchs, 1986).

A meta-analysis of 18 studies by Fuchs and Fuchs (1986) estimated the effect magnitude of ongoing progress monitoring to be 0.70. Specifically, it appears that graphing rather than simply recording student data in tabular form relates to positive student outcomes, with student achievement improving approximately 0.5 of a standard deviation unit. CBM monitoring that incorporated data utilization rules was associated with increased student achievement of approximately 0.91 of a standard deviation unit.

**Quality indicators.** Quality indices of interventions (i.e., behavioral definition, direct measure, step-by-step plan, intervention implemented as planned, graphing of results, and direct comparison to baseline) were investigated as predictors of intervention outcomes from a sample of general education teachers and support services personnel (Flugum, 1992; Flugum & Reschly, 1992, 1994). The majority of the interventions were significantly deficient in these critical areas. Analysis for both groups of respondents indicated a low implementation rate of five of the six specific quality indicators. Approximately three-fourths of the respondents, however, indicated that the intervention was implemented as planned (i.e., treatment integrity). Therefore, it appears that the typical intervention does not involve a behavioral definition, a direct measure, a systematic plan, graphing of results, or comparison of results to baseline. Those interventions that did implement quality indicators,
however, were seen as being more successful by teachers and support services personnel (Flugum, 1992; Flugum & Reschly, 1992, 1994). Individually, all the indices with the exception of baseline data were found to be associated with positive student outcomes. In addition, a significant relation was found between the number of quality indices and some outcome measures. The authors strongly suspected that greater implementation of the quality indicators would produce more effective interventions and better outcomes.

The major limitation of the Flugum research is that the information was based on self-report data from teachers and support staff. There was no proof of the actual use of these quality indices, thus raising questions as to the relation between quality interventions and student outcomes. In addition, outcome measures were also self-report relying on individual's perception of the effectiveness of the intervention.

Training

While more controlled studies with actual manipulation of the quality indicators need to be conducted, training practitioners in designing and implementing interventions may be the first step in insuring positive student outcomes (Flugum, 1992). Training methods found in the empirical literature to be particularly effective include modeling, role playing, and trial implementation with feedback, as well as didactic instruction techniques (i.e., written material, lecture, discussion) when used in combination with one or more of the other methods (Anderson & Kratochwill, 1988). Merely providing professionals with information about new knowledge or practices is woefully inadequate for producing behavior change in educators or improved learning in students (Green, 1995).

Bergan and Kratochwill (1990) suggested three formats to be used to train practitioners in consultation and intervention: (a) individual competency-based training—training for specific objectives within each phase of behavioral consultation in order to maximize success in identifying, analyzing, and evaluating a problem and the related intervention; (b) workshop-based training varying in lengths and formats; and (c) self-instructional training.
To add to these formats, Kratochwill and Bergan (1990) developed standardized protocols to facilitate behavioral consultation training activities. Use of these protocols provides a mechanism for the trainer to identify when specific goals and objectives have been met and for the trainee to self-monitor their performance.

McDougall, Reschly, and Corkery (1988) evaluated the effectiveness of a 1-day inservice workshop on behavioral consultation using a competency-based approach. Training focused on Bergan’s (1977) behavioral consultation Problem Identification stage. As a result, three specific quality indicators were trained: behavioral definition, functional analysis (antecedents and consequences), and goal setting. The authors found significant change in the mean percentage of trainees meeting these objectives from pre-training to post-training: (a) behavioral definition—47.1% to 91.0%; (b) antecedents defined—29.4% to 94.1%; (c) consequences defined—35.3% to 94.1%; and (d) goal set—5.9% to 58.8%. McDougall et al.’s study suggests that competency-based training, even within the limits of a 1-day workshop, can be effective in teaching problem-solving skills.

As part of the Relevant Educational Assessment and Intervention Model (RE-AIM: Reschly & Grimes, 1991), practitioners participated in a 2-day continuing education workshop on a protocol-based form of Bergan & Kratochwill’s (1990) behavioral consultation. All participants were expected to apply problem-solving consultation to two cases subsequent to the training. The 2-day workshop provided information through lecture, reading, modeling, demonstration of competencies, role playing with feedback, questions/answers and discussion, and extensive interview outlines (i.e., protocols). Follow-up activities such as teleconferences, audio and video tapes, and local support persons were provided over the next 12-week period. Participants were then required to submit two case studies that reflected implementation of the four-stage problem-solving process. A replication of McDougall et al. (1988), this study evaluated the impact of protocol-based training on the problem-solving skills, particularly three specific quality
indicators: behavioral definition, functional analysis (antecedents, consequences, and situational conditions), and goal setting. Once again, significant changes in the mean percentage of trainees meeting these objectives from pre-training to post-training were found: (a) behavioral definition—42% to 75%; (b) antecedents defined—23% to 50%; (c) consequences defined—24% to 69%; (d) situational conditions defined—37% to 71%; and (e) goal set—9% to 45% (Reschly & Flugum, 1993).

McDougall et al.'s (1988) findings, the RE-AIM results, and Bergan and Kratochwill's (1990) work, strengthens Kratochwill, VanSomeren, and Sheridan's (1989) claim that training in protocol-based consultation clearly improves both the provision and quality of interventions. The current training research, however, has focused on general components of problem solving examining whether they are present or absent—the level of quality to which each is implemented has not been evaluated. All nine recommended "best practice" intervention components (Tilly & Flugum, 1995) with their expanded criteria have not been included in continuing education research. In addition, no information is available as to the impact of the use of a protocol (i.e., extensive outline with cues for specific intervention components) without the training on the quality and outcomes of problem-solving interventions.

**Purpose of the Study**

Currently there is little information regarding the efficacy of school-based problem-solving. In addition, there is a need to determine which components (i.e., quality indices) are essential for these interventions to result in positive outcomes for students. Limited research suggests there is a relation between quality interventions, as indicated by the presence of specific indicators, and positive student outcomes (Flugum, 1992; Flugum & Reschly, 1992, 1994); these findings, however, were based on self-report data with no intervention documentation to verify quality or outcomes. Research (e.g., McDougall et al., 1988; Kratochwill et al., 1989) also supports the use of protocol-based training to influence
the quality of interventions; yet, questions remain as to the effect of the protocol versus the training (i.e. do higher quality interventions occur due to the training or to the use of a protocol that lead practitioners through specific steps). In addition to answering this question, this study attempted to overcome the weaknesses of previous research on quality indicators of interventions and validate recommended "best practice" (i.e., Tilly & Flugum, 1995). This study also contributed to the research on the efficacy of school-based problem solving by examining the impact of intervention quality indicators on student outcomes.

**Research Questions and Hypotheses**

Following are the specific research questions and hypotheses addressed in this study:

1. **Does training in designing and implementing interventions increase the quality of the intervention?**
   
   **Hypothesis:** *Interventions designed and implemented after training will contain more quality indicators and have a higher level of quality than those implemented and designed before training.*

2. **Do the intervention documentation materials influence the quality of the intervention?**

   **Hypothesis:** *Interventions developed on the Intervention Documentation Protocol denoting the nine quality indicators will contain more quality indicators and have a higher level of quality than those developed on other intervention documentation materials.*

3. **Is there a positive relation between the quality of the intervention and the outcome of the intervention?**

   **Hypothesis:** *There is a positive relation between the quality of the intervention and the outcome of the intervention: (a) those interventions implementing more quality indicators lead to more positive student outcomes; and (b) those interventions with a higher level of quality lead to more positive student outcomes.*
MATERIALS AND METHODS

Participants and Sampling

Subject of Study

The focus of this study was on school-based problem-solving interventions. Examination of the quality of the interventions (as indicated by quality indices), student outcomes, and the relation between the two were the focus of the research.

Participants

Practitioners. Forty-two school psychologists, 42 educational consultants, and 33 school social workers employed by Heartland Area Education Agency 11, an intermediate educational agency in Iowa, were asked to participate in this study. The agency is divided into six regional zones (see Appendix D): Northern, Northeastern, Middle, Western, Southeastern, and Southwestern. Each zone was randomly assigned to one of three sequences of conditions: (a) Baseline—Training & Protocol—Follow-Up & Protocol; (b) Baseline—Protocol Only—Training & Protocol; and (c) Baseline—Baseline—Training & Protocol. The zone each practitioner works within determined the treatment sequence in which they participated.

Participants were informed of the study's purpose and the requirements during a staff orientation meeting at the beginning of the school year. At this time they were also notified of the procedures established to maintain confidentiality for themselves, students, teachers, and parents.

Thirty-eight of 42 (90%) school psychologists, 35 of 42 (83%) educational consultants, and 25 of 33 (76%) school social workers attended the training sessions. Thirty-one school psychologists (74%), 30 educational consultants (71%), 19 school social workers (58%), and five practitioners with unidentified disciplines submitted at least one problem-solving case. Ten of the school psychologists (24%), eight of the educational consultants (19%), and three of the school social workers (9%) submitted all three problem-solving cases.
Of the practitioners submitting at least one case, 25% \((n = 20)\) were males and 75% \((n = 60)\) were females—this is representative of the agency's proportions of male (20%) and female (80%) school psychologists, educational consultants, and school social workers. Fifty-three percent held Masters degrees, 29% held Specialist degrees, 4% held Doctoral degrees, with 3% reported holding other degrees. These practitioners had an average of 11.6 years of experience in their discipline.

**Students.** Of the 145 usable cases, 136 contained specific gender and grade information on the target student. Ninety-six (71%) of the students were males, 40 (29%) were females. All but twelfth grade was represented; however, a large majority of the students were in first through fourth grade. Half of the students were in first grade (31%) or second grade (20%). Another quarter of the students were in third grade (13%) or fourth grade (12%). These student demographics are similar to other research conducted within Heartland Area Education Agency 11 (Noell, Allison & Gansle, 1995): 74% male students and 89% elementary students.

**Teachers.** One-hundred twenty-one teachers responded to the request for an outcome rating of the intervention. Fourteen percent \((n = 17)\) were males and 86% \((n = 104)\) were females. Almost three-fourths (73%) of the teachers held Bachelors degrees, 25% held Masters degrees, none held Doctoral degrees, and 2% reported holding other degrees. The teachers had an average of 13.0 years of teaching experience.

**Materials**

The materials needed for this study were different for each treatment condition. For the Baseline phase, the materials were the current intervention documentation materials used by each practitioner. Materials were any of the agency's intervention documentation forms provided in their program manual (see Appendix E) or any other method of documentation meeting the agency's criteria: (a) a written plan based on an individual student's problem; (b) a clear statement or description of the behavior; (c) a problem analysis which leads to an
intervention decision; (d) a description of the actual intervention plan including what is to be done, when, how, and by whom; and (e) a plan for measuring outcomes which can be used to make data-based adjustments as needed during the course of the intervention, including a description of measurement and recording techniques, baseline or pre-treatment level of performance, monitoring schedule, and behavior levels at the predetermined monitoring times. To supply consistent outcome data across treatment conditions, Baseline participants were also asked to complete one question as to the outcome of the intervention (see Appendix F). The form containing the outcome question also requested the following demographic information from the practitioners: gender, years of experience, and highest degree held.

The Protocol Only phase used an Intervention Documentation Protocol (see Appendix G) from Flugum (1994) adapted from Tilly and Flugum (1995) and the Iowa Department of Education’s Student Improvement is Job #1 program (August, 1994). The Intervention Documentation Protocol contained headings and cues for each of the nine quality indicators (i.e., behavioral definition, baseline data, problem validation, functional analysis, goal setting, intervention plan, treatment integrity, progress monitoring, and program evaluation). In addition, it contained the outcome question used during the Baseline phase.

Materials for the Training & Protocol phase were the Intervention Documentation Protocol used in the Protocol Only phase and the training materials (see Appendix H for the trainer’s manual). The training manual contained an overview of each of the nine quality indices, formats for each indicator, and practice items for each component using both academic and non-academic target behaviors. The practitioners received a copy of the trainer’s manual in a cloze format i.e., words in italics in Appendix H were replaced by blank lines for the trainee’s packets.
Materials for those participants in the Follow-Up & Protocol phase included the training materials (see Appendix I), the Intervention Documentation Protocol, and practitioners' cases in which they had questions.

**Procedure**

**Design**

Each zone was randomly assigned to one of three conditions: (a) Baseline—Training & Protocol—Follow-Up & Protocol - Western and Middle zones, (b) Baseline—Protocol Only—Training & Protocol - Southeastern and Northeastern zones, and (c) Baseline—Baseline—Training & Protocol - Southwestern and Northern zones. The first zone assigned to each condition (Western, Southeastern, and Southwestern zones) participated in the first group (August 28, 1995 to March 8, 1996). The second zone assigned to each condition (Middle, Northeastern, and Northern zones) participated in the second (November 13, 1995 to May 24, 1996). Figure 2 details the order and timelines for each zone and treatment condition. Each treatment phase lasted for nine weeks, with the week of December 25, 1995 being excluded due to the holiday break.

Participants were notified of the study during an orientation meeting at the start of the educational year (see Appendix J for handout). At this time practitioners were informed of their zone's assigned treatment condition, the time frames, and the general requirements for each treatment phase. Procedures for coding materials, maintaining confidentiality, and submitting intervention documentation materials were discussed.

Practitioners participating in the first group received written instructions (see Appendix K) and the outcome question for the Baseline phase (see Appendix F) the Friday prior to the start of the phase. Those participating in the second group received written instructions the Friday prior to the start of their Baseline phase. For each treatment phase, participants were asked to submit one problem-solving case—a total of three cases were requested from each practitioner.
Figure 2. Timeline, Conditions, and Zone Assignment

**Baseline.** During the Baseline phase, participants were asked to turn in all intervention documentation for one "completed" problem-solving case in which they actively contributed to the design and/or implementation of the intervention. A "completed" case refers to (a) any intervention that began and finished during the time frame for that condition; or (b) any intervention that began during the time frame for that condition and has been implemented a minimum of three weeks—all intervention documentation gathered up to the
last day of that treatment phase was considered part of that case. A week prior to and a week after the completion of this phase, participants received a letter reminding them to submit the documentation (see Appendix L for sample format). Those persons in the Baseline—Baseline—Training & Protocol condition received another set of instructions the Friday prior to the start of the second Baseline phase (see Appendix M).

**Protocol Only.** The Friday prior to the start of the Protocol Only phase, participants received the Intervention Documentation Protocol with a brief letter reminding them to use the protocol with one problem-solving case in which they actively contributed to the design and implementation of the intervention during the specified time frame (see Appendix N for sample format). The requirements for a completed case are the same as those during the Baseline phase. A week prior to and a week after the completion of this phase, participants received a letter reminding them to submit the documentation.

**Training & Protocol.** For the Training & Protocol phase, practitioners attended a full-day training session the Thursday prior to the start of that phase. The researcher conducted the training for the Western, Southeastern, Middle, and Northeastern zones. Due to an overlap in training dates, the Heartland Area Education Agency 11 researcher, Dr. Martin Ikeda, conducted the other two training sessions—Southwestern and Northern zones. To ensure standardization in the training, Dr. Ikeda observed the training sessions on October 26, 1995 and January 18, 1996. The training included an overview of each of the nine quality indices, formats for each indicator, and practice on each component using both academic and non-academic target behaviors (see Appendix H for training manual). In addition, the Intervention Documentation Protocol was provided for participants to use on one problem-solving case for which they actively contributed to designing and/or implementing the intervention. Requirements for a completed case were the same as those during the other two treatment conditions. As with the other two phases, a week prior to and
a week after the completion of this phase, participants received a letter reminding them to submit the documentation.

**Follow-Up & Protocol.** Those practitioners participating in the Follow-Up & Protocol phase attended a 2-hour session at the start of the phase. The nine quality indices were reviewed, and questions and concerns were addressed using practitioners' cases (see Appendix I for training manual). A week prior to and a week after the completion of this phase, practitioners received a letter reminding them to submit the documentation (and the outcome question to be answered if they chose not to use the Intervention Documentation Protocol).

**Problem-Solving Cases**

A total of three cases were requested of each practitioner—351 cases possible. Information was received on 157 cases (45%); however, not all of these cases were complete. Six of the cases were simply practitioners indicating they had not had the opportunity to participate in an intervention during that phase.

Fifty-three percent of the target problems were academic and 47% were non-academic problems. It is estimated that the interventions were implemented for an average of 29 school days (range: 6-180 days; $SD = 21.5$) as indicated by the collection of baseline data and progress monitoring data.

**Data Collection**

Data collection occurred through the intervention documentation for the three cases submitted by each participant. Each practitioner was assigned a code based on zone assignment and agency practitioner code; in addition, a one-letter code indicated which treatment condition—"B" for Baseline, "P" for Protocol Only, "T" for Training & Protocol, and "F" for Follow-Up & Protocol phases. The researcher was not aware of the practitioner names matched to the practitioner codes. Protocols distributed during the Protocol Only,
Training & Protocol, and Follow-Up & Protocol phases were coded by the researcher with the appropriate letter (i.e., "P," "T," and "F").

Variables

Quality Indicators

The quality indices were coded by the researcher from the submitted intervention documentation. For each individual case, the nine quality indices were coded two ways to examine the presence and level of quality indicators.

Presence. The presence or absence of each quality indicator was coded by simply noting if it was indicated by a heading and/or was in a similar format to that presented in the training. The number of "yes" codes was summed to obtain the number of indices present (0-9).

Level. Innovation configurations for each quality indicator also were used to rate the level of quality of each component from 1 to 5 (1 being not present and 5 being implemented fully) (see Appendix O). The individual rankings for each indicator were totaled to comprise a composite ranking to indicate total quality (9 to 45).

Innovation configurations were developed from the existing literature on each indicator (as summarized in the Literature Review section). To determine if the configurations had content validity (i.e., the measure's point scheme follows the relevant criteria reported in the literature), expert judges subjectively evaluated the point scheme for each indicator. As authors of papers on quality indices of interventions, Dr. W. David Tilly, III and Dr. Daniel J. Reschly judged the content validity of the existing innovation configurations for all nine components. In addition, an expert in applied behavior analysis and a trainer for this study, Dr. Martin Ikeda from Heartland Area Education Agency 11, served as an expert judge. Consensus was obtained as to the validity of the innovation configuration.

Inter-rater agreement. Inter-rater agreement was calculated on 24% of the intervention documentation materials. The researcher and two Iowa State University
graduate students in School Psychology independently coded the materials—the median response was used for later data analyses. Three measures of inter-rater agreement were evaluated: (a) kappa coefficients for individual components, (b) percent of agreement and adjacent scores for number of quality indicators, and (c) correlations for the total level of quality.

Tables 1 and 2 contain the obtained kappa coefficients calculated on the presence of and the level of quality for each individual intervention component. Cohen's kappa (1960) is a useful statistic for measuring inter-rater agreement for categorical and ordinal data; it indicates the proportion of agreement after chance agreement is excluded. Kappa coefficients range from -1 to +1: (a) When kappa is positive, the proportion of observed agreement is more than the proportion of chance agreement; (b) When kappa is equal to zero, the proportion of observed agreement equals the proportion of chance agreement; and (c) When kappa is negative, the proportion of observed agreement is less than the proportion of chance agreement (Cohen). A kappa of .60 (Gelfand & Hartmann, 1975; Hartmann, 1977) to .70 (Sattler, 1988) is considered to indicate an acceptable level of agreement. Thirteen of the 15 kappas calculated for the presence of the quality indices met or exceeded acceptable levels of agreement. Only 3 of the 19 kappa coefficients calculated for the level of quality were .60 or greater, while seven were between .50 and .59; the remaining nine kappas were between .28 and .47.

Inter-rater agreement also was evaluated for the number of quality indicators present and the total level of quality. Pairings of each three raters' responses found 58%, 61%, and 82% exact agreement on the number of quality indices present and 92%, 95%, and 95% agreement including adjacent ratings. In addition, the three raters' responses correlated highly on the total level of quality ($r = .86, p < .05$; $r = .89, p < .05$; $r = .88, p < .05$).
Table 1. Kappa coefficients for presence of quality indicators

<table>
<thead>
<tr>
<th>Presence of Quality Indicator</th>
<th>Rater Pairing</th>
<th></th>
<th></th>
<th>Student #2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Researcher &amp;</td>
<td>Researcher</td>
<td>Graduate Student</td>
<td>Graduate Student</td>
</tr>
<tr>
<td></td>
<td>Graduate Student</td>
<td>#1</td>
<td>#2</td>
<td></td>
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<tr>
<td>Behavioral Definition</td>
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<td>.34</td>
<td>.34</td>
<td></td>
</tr>
<tr>
<td>Baseline Data</td>
<td>-.a</td>
<td>-.a</td>
<td>-.a</td>
<td></td>
</tr>
<tr>
<td>Problem Validation</td>
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<td>.58</td>
<td>.75</td>
<td></td>
</tr>
<tr>
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<td>.89</td>
<td>.69</td>
<td>.60</td>
<td></td>
</tr>
<tr>
<td>Goal Setting</td>
<td>-.a</td>
<td>-.a</td>
<td>-.a</td>
<td></td>
</tr>
<tr>
<td>Intervention Plan</td>
<td>-.a</td>
<td>-.a</td>
<td>-.a</td>
<td></td>
</tr>
<tr>
<td>Treatment Integrity</td>
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<td>.71</td>
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</tr>
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<td>Progress Monitoring</td>
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<td>.84</td>
<td>1.00</td>
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<tr>
<td>Program Evaluation</td>
<td>-.a</td>
<td>.65</td>
<td>-.a</td>
<td></td>
</tr>
</tbody>
</table>

a Kappa coefficients were not calculated because the number of non-empty rows or columns was one.
Table 2. **Kappa coefficients for the level of quality for each indicator**

<table>
<thead>
<tr>
<th>Level of Quality for the Indicator</th>
<th>Rater Pairing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Researcher &amp; Graduate Student</td>
</tr>
<tr>
<td></td>
<td>#1</td>
</tr>
<tr>
<td>Behavioral Definition</td>
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<td>Baseline Data</td>
<td>.51</td>
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<tr>
<td>Problem Validation</td>
<td>.75</td>
</tr>
<tr>
<td>Functional Analysis</td>
<td>.50</td>
</tr>
<tr>
<td>Goal Setting</td>
<td>.4 a</td>
</tr>
<tr>
<td>Intervention Plan</td>
<td>.4 a</td>
</tr>
<tr>
<td>Treatment Integrity</td>
<td>.53</td>
</tr>
<tr>
<td>Progress Monitoring</td>
<td>.35</td>
</tr>
<tr>
<td>Program Evaluation</td>
<td>.4 a</td>
</tr>
</tbody>
</table>

*Kappa coefficients could not be calculated because row values did not equal column values.*

**Student Outcomes**

Outcomes were measured using four methods: self-report ratings from both the practitioner and teacher, visual analysis score, and expert ratings. Spearman’s rho correlation coefficients were calculated between all four outcome measures. Significant correlations (.29 - .78) with p-values of less than .001 were found for all six comparisons.

**Self-report ratings.** Student outcomes were measured using two self-report methods: practitioner ratings and teacher ratings. Practitioners were asked to classify the
outcome using the ratings contained on Heartland Area Education Agency's intervention summary paperwork: (a) problem resolved, (b) progress being made, continuing with plan, (c) problem not resolved, redesigning or modifying the intervention, or (d) problem not resolved, determining entitlement for special education. Teachers were asked to rate the outcome using ratings taken from the Iowa Department of Education's *Student Improvement is Job #1* protocol (refer to Appendix C): (a) Desired level of progress achieved. Problem resolved. (b) Acceptable level of progress achieved. Continuing with the plan. (c) Progress is slow or has come to a halt. Redesigning or modifying the intervention. or (d) No progress or the problem is getting worse. Seeking additional resources.

**Visual analysis.** Kazdin's (1982) four visual analysis criteria were applied to those cases in which a visual representation of the outcome data (i.e., graph) was submitted \( n = 110 \)—change in mean, change in level, change in trend, and latency of change. Visual analyses of changes in magnitude and rate involves the evaluation of four characteristics: (a) changes in mean and level (magnitude characteristics); and (b) changes in trend and latency (rate characteristics). Change in mean refers to the shift in the average rate of performance between phases. Change in level refers to discontinuity of performance from the end of one phase to the start of the next phase. Change in trend refers to the tendency for the data to show systematic increases or decreases over time. Latency of change refers to the period between the change in conditions (e.g., starting or stopping intervention) and change in performance. It is important to note that, "Changes in means, levels, and trends, and variations in the latency of change across phases frequently accompany each other. Yet they are separate characteristics of the data and can occur alone or in combination" (Kazdin, p. 237).

Visual analysis is quick to yield conclusions; however, difficulty with interpretation arises when (a) changes are subtle between baseline and intervention phases, (b) data evidence variability and overlap, and (c) level and trend are not easily discernible
(Kratochwill et al., 1995). While visual analysis has been criticized for being an insensitive method, it is in fact a conservative measure: it identifies only large effects and fails to detect subtle changes in the dependent variable (Gresham & Noell, 1993). "(I)t may be a more useful way of determining the practical significance of treatment effects" (Gresham & Noell, p. 261).

The researcher answered the following questions regarding the four characteristics of visual analysis: (a) Mean—Is the average rate of performance higher (or lower) during the intervention than during baseline?; (b) Level—Is there a discontinuity of performance (in the desired direction) from the end of baseline to the start of the intervention?; (c) Trend—Does the trend in performance increase (or decrease) over time?; and (d) Latency—Is there a change in performance (in the desired direction) after the first week of intervention implementation? The number of "yes" responses comprised an outcome score ranging from 0 to 4. If the intervention did not contain baseline data, a “no” was indicated for change in mean and change in level. If a time frame was not indicated on the graph, no point was awarded for latency of change. Heartland Area Education Agency training has recommended at least seven data points to calculate a trend—if fewer than seven data points were present, no point was given for change in trend.

**Expert ratings.** Experts in assessment and intervention were asked to rate the student outcomes of the interventions: (a) Student performance improved greatly, this intervention was highly effective. (b) Student performance improved but not greatly, this intervention was somewhat effective. (c) Student performance did not change, this intervention was not effective. (d) Student performance got worse, this intervention was not effective. or (e) Not enough data to make a decision. The experts were given directions and criteria to incorporate their knowledge of the type of behavior, expected rates of change, developmental norms, and other relevant factors, with visual analysis decision-making rules to rate the intervention outcome (see Appendix P for letter to expert raters). The expert raters
also were asked two additional questions: (a) How difficult to change is this target behavior? (4-point Likert-scale: 1 = very difficult to 4 = very easy) and (b) How appropriate was this intervention for the target behavior? (4-point Likert-scale: 1 = very inappropriate to 4 = very appropriate).

The academic cases were divided among experts in academic assessment and intervention: Dr. Lynn Fuchs from Peabody College, Vanderbilt University; Dr. Ken Howell from Western Washington University; Dr. W. David Tilly III from the Iowa Department of Education, Bureau of Special Education; Dr. Dawn Hubbard from the Northeast Kansas Education Service Center; Dr. Anne Foegen from Iowa State University; and Jeff Grimes from the Iowa Department of Education, Bureau of Special Education. The non-academic cases were divided among the experts in social/emotional/behavioral assessment and intervention: Dr. Daniel Reschly from Iowa State University; Dr. Martin Ikeda of Heartland Area Education Agency 11; Dr. Ken Merrill from the University of Iowa; Dr. George Noell from Louisiana State University; Dr. Rick Spicuzza from the University of Minnesota; and Dr. Randy Sprick of Teaching Strategies, Inc. in Eugene, Oregon.

Each rater received no more than 20 cases, with 9 to 10 of those cases being rated by three other experts. Nineteen percent of the cases (n = 29) were rated by four experts to determine inter-rater agreement—the median rating was used for later data analyses. Fleiss' (1971) method of calculating nominal scale agreement among many raters using kappa was used to determine inter-rater agreement. The following kappa coefficients were obtained: (a) outcome rating—academic cases $K = .30, p < .01$; non-academic cases $K = .29, p < .01$; (b) difficulty of change—academic cases $K = .04, ns$; non-academic cases $K = .09, ns$; and (c) appropriateness of intervention—academic cases $K = .08, ns$; non-academic cases $K = .07, ns$. Since the questions pertaining to difficulty of change and appropriateness of the intervention did not obtain reliable results, they were not used for any additional data analyses.
RESULTS AND DISCUSSION

After descriptive results for each variable are discussed, the study's results will be described to address the research questions in the order in which they were presented. First, training effects on intervention quality will be explained. Second, the impact of the protocol will be demonstrated. Third, the relation between intervention quality and student outcome will be evaluated.

One-way analysis of variance (ANOVA) results did not indicate differences between the six zones (Western, Southeastern, Southwestern, Middle, Northeast, and Northern) at Baseline phase for either the number of quality indices present $F(5,61) = 0.49, p > .05$ or the total level of intervention quality $F(5,61) = 0.76, p > .05$. Since significant differences were not found between individual zones, the two zones in each condition were combined—Western and Middle zones were combined, Southeastern and Northeastern zones were combined, and Southwestern and Northern zones were combined—for the remaining data analyses.

Similar results for the differences between zones were found in comparisons of the three conditions (Baseline—Training & Protocol—Follow Up & Protocol; Baseline—Protocol Only—Training & Protocol; Baseline—Baseline—Training & Protocol) at the Baseline phase for both measures of quality: number of quality indices $F(2,64) = 0.17, p > .05$ and total level of quality $F(2,64) = 0.47, p > .05$. Due to the non-significant differences between the conditions, the phases were combined—Baseline, Protocol Only, Training & Protocol, and Follow-Up & Protocol—for the remaining data analyses between treatment conditions.

Descriptives

**Presence of Quality Indicators**

Percentages of quality indicators' presence across treatment phases are presented in Table 3. At Baseline and Repeated Baseline, individual quality indicators ranged from not being present in any case to being present in all cases. With the introduction of the
intervention documentation protocol, the presence of specific components increased to
between 70% and 100%. Cases collected during the Training & Protocol phase contained
76% to 100% of each of the quality indices. Follow-Up & Protocol cases had present
between 58% and 100% of the intervention components. Only one of the treatment
phases—Protocol Only—came close to having the majority of the quality indicators present
in all cases; however, only five of the nine components (i.e., baseline data, problem
validation, goal setting, intervention plan, and program evaluation) were present in 100% of
the cases.

Table 3. Percentage of quality indicators present across treatment phases

<table>
<thead>
<tr>
<th>Quality Indicators</th>
<th>Repeated Baseline (n = 67)</th>
<th>Protocol Baseline (n = 19)</th>
<th>Only (n = 10)</th>
<th>Training &amp; Protocol (n = 37)</th>
<th>Follow-Up &amp; Protocol (n = 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Definition</td>
<td>87%</td>
<td>95%</td>
<td>90%</td>
<td>97%</td>
<td>92%</td>
</tr>
<tr>
<td>Baseline Data</td>
<td>52%</td>
<td>47%</td>
<td>100%</td>
<td>97%</td>
<td>83%</td>
</tr>
<tr>
<td>Problem Validation</td>
<td>31%</td>
<td>21%</td>
<td>100%</td>
<td>95%</td>
<td>75%</td>
</tr>
<tr>
<td>Functional Analysis</td>
<td>61%</td>
<td>74%</td>
<td>80%</td>
<td>95%</td>
<td>67%</td>
</tr>
<tr>
<td>Goal Setting</td>
<td>94%</td>
<td>100%</td>
<td>100%</td>
<td>95%</td>
<td>100%</td>
</tr>
<tr>
<td>Intervention Plan</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>92%</td>
</tr>
<tr>
<td>Treatment Integrity</td>
<td>0%</td>
<td>0%</td>
<td>70%</td>
<td>76%</td>
<td>58%</td>
</tr>
<tr>
<td>Progress Monitoring</td>
<td>85%</td>
<td>79%</td>
<td>90%</td>
<td>97%</td>
<td>92%</td>
</tr>
<tr>
<td>Program Evaluation</td>
<td>75%</td>
<td>90%</td>
<td>100%</td>
<td>92%</td>
<td>100%</td>
</tr>
</tbody>
</table>
The overall presence of each quality indicator was as follows: behavioral definition, 91%; baseline data, 69%; problem validation, 55%; functional analysis, 73%; goal setting, 96%; intervention plan, 99%; treatment integrity, 29%; progress monitoring, 88%; and program evaluation, 85%. These results would indicate variable and less than optimal implementation of “best practice” recommendations for designing and implementing quality interventions.

**Level of Quality**

Mean levels of quality for each component for each treatment phase are presented in Table 4. The quality of intervention components at Baseline and Repeated Baseline phases ranged from 1.00 to 3.69, with seven of the nine components having a rating of less than 3.00. The quality improved with the introduction of the intervention documentation protocol and training with ranges of 1.90 to 4.60 for the Protocol Only cases, 2.65 to 4.03 for the Training & Protocol cases, and 2.00 to 4.17 for the Follow-Up & Protocol cases. However, only three quality indicators—problem validation, progress monitoring, and program evaluation—came close to approaching “best practice” standards as indicated by a rating of 4.00 or higher.

Mean levels of quality combined across treatment phases were as follows: behavioral definition, $M = 2.87$ ($SD$ 1.24); baseline data, $M = 2.26$ ($SD$ 1.32); problem validation, $M = 2.83$ ($SD$ 1.81); functional analysis, $M = 2.19$ ($SD$ 1.09); goal setting, $M = 2.88$ ($SD$ 1.34); intervention plan, $M = 2.57$ ($SD$ 0.96); treatment integrity, $M = 1.63$ ($SD$ 1.16); progress monitoring, $M = 3.57$ ($SD$ 1.34); and program evaluation, $M = 3.51$ ($SD$ 1.31). These results would indicate that only two of the indicators (progress monitoring and program evaluation) met acceptable levels of quality, one of the indices (treatment integrity) did not meet even minimal standards of implementation, and the remaining six components (behavioral definition, baseline data, problem validation, functional analysis, goal setting, and intervention plan) reached only minimal levels of quality implementation.
Table 4. Mean level of quality for intervention components across treatment phases

<table>
<thead>
<tr>
<th>Quality Indicators</th>
<th>Treatment Phase</th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Baseline (n = 67)</td>
<td>Repeated Baseline (n = 19)</td>
<td>Protocol Only (n = 10)</td>
<td>Training &amp; Protocol (n = 37)</td>
<td>Follow-Up &amp; Protocol (n = 12)</td>
</tr>
<tr>
<td>Behavioral Definition</td>
<td>2.33</td>
<td>2.16</td>
<td>3.20</td>
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</tr>
<tr>
<td>Baseline Data</td>
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<td>1.84</td>
<td>3.10</td>
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<tr>
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<td>2.00</td>
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<td>Goal Setting</td>
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<tr>
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<td>3.53</td>
<td>4.10</td>
<td>3.73</td>
<td>4.17</td>
</tr>
</tbody>
</table>

Student Outcomes

Table 5 displays the mean rating for each outcome measure for each treatment phase. Based on teacher and practitioner ratings, interventions conducted during Baseline and Repeated Baseline phases resulted in slow progress and a needed to be redesigned or modified. Self-report ratings for the other phases—Protocol Only, Training & Protocol, and Follow-Up & Protocol—also indicated less than ideal results with ratings falling somewhere between a need to redesign/modify the intervention and continue the intervention since the problem was still not resolved. Visual analysis scores found similarly undesirable outcomes. Mean scores for the different phases ranged from 1.18 to 1.76. In other words, the average intervention met less than two of the visual analysis characteristics. Experts'
ratings of outcomes varied more across phases than the other three ratings. Interventions designed and implemented during the Baseline and Repeated Baseline phases tended to be ineffective. However, those interventions conducted during the Protocol Only, Training & Protocol, and Follow-Up & Protocol phases appeared to be somewhat effective.

Table 5. Mean outcome ratings across treatment phases

<table>
<thead>
<tr>
<th>Treatment Phase</th>
<th>Repeated</th>
<th>Protocol</th>
<th>Training &amp; Protocol</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome Rating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practitioner Rating(^a)</td>
<td>1.98</td>
<td>2.21</td>
<td>2.33</td>
<td>2.52</td>
</tr>
<tr>
<td>Teacher Rating(^b)</td>
<td>2.19</td>
<td>2.59</td>
<td>2.60</td>
<td>2.48</td>
</tr>
<tr>
<td>Visual Analysis Score(^c)</td>
<td>1.18</td>
<td>1.60</td>
<td>1.44</td>
<td>1.76</td>
</tr>
<tr>
<td>Expert Rating(^d)</td>
<td>1.95</td>
<td>1.81</td>
<td>2.89</td>
<td>3.14</td>
</tr>
</tbody>
</table>

\(^a\) Practitioner Rating: 4 = Problem resolved; 3 = Progress being made, continuing with plan; 2 = Problem not resolved, redesigning or modifying the intervention; 1 = Problem not resolved, determining entitlement for special education.

\(^b\) Teacher Rating: 4 = Desired level of progress achieved. Problem resolved. 3 = Acceptable level of progress achieved. Continuing with the plan. 2 = Progress is slow or has come to a halt. Redesigning or modifying the intervention. 1 = No progress or the problem is getting worse. Seeking additional resources.

\(^c\) Visual Analysis Score = Number of "yes" responses to Change in Mean?, Change in Trend?, Change in Level?, and Latency of Change?

\(^d\) Expert Rating: 4 = Student performance improved greatly, this intervention was highly effective; 3 = Student performance improved but not greatly, this intervention was somewhat effective; 2 = Student performance did not change, this intervention was not effective; 1 = Student performance got worse, this intervention was not effective; 0 = There is not enough information to rate the effectiveness of the intervention.
Outcome measures collapsed across treatment phases yielded the following ratings: practitioners’ rating, $M = 2.22$ ($SD$ 1.07); teachers’ rating, $M = 2.39$ ($SD$ 0.99); visual analysis score, $M = 1.45$ ($SD$ 1.35); and experts’ rating, $M = 2.36$ ($SD$ 1.40). These findings would suggest interventions are not resulting in extremely positive student outcomes. Despite these less than positive outcomes, practitioners indicated only 38% of the interventions were moving to Level IV of the problem solving model (i.e., determination of entitlement for special education) and teachers reported only 27% of the interventions required seeking of additional resources.

**Effect of Training**

To determine the effect of training on intervention quality, comparisons of the mean number of quality indices and the total level of quality were made between conditions within the second and third phase of the treatment sequence, and between those conditions involving training and those that did not. One-way analyses of variance (ANOVAs) were calculated for comparisons among phase conditions (Baseline—Protocol Only—Training & Protocol; Follow-Up—Training & Protocol—Training & Protocol). T-tests were calculated for comparisons between those cases completed with training and those without training (Baseline and Protocol Only versus Training & Protocol and Follow-Up & Protocol).

**Comparisons Between Phase Conditions**

Tables 6 and 7 show results from ANOVAs indicating significant differences between the second phase conditions (Repeated Baseline, Protocol Only, and Training & Protocol) for both number of quality indices $F(2,45) = 22.09$, $p < .001$ and total level of quality $F(2,45) = 16.21$, $p < .001$. Post-hoc analysis using Scheffe's test indicated that Repeated Baseline cases were significantly lower in quality than Protocol Only and Training & Protocol cases for both measures of quality. However, there were no differences in quality—number or level—between Protocol Only and Training & Protocol cases. The use of the protocol without training, the least complex condition, was sufficient to improve
intervention quality significantly. Additional training on the quality indices did not appear to improve intervention quality further. For both the Protocol Only and Training & Protocol conditions the mean number of quality indices present was approaching the ceiling of 9 (8.30 and 8.37, respectively). However, the average total level of quality was far from reaching the ceiling of 45 with 29.80 for Protocol Only cases and 31.21 for Training & Protocol cases.

ANOVA results did not indicate differences between the third phase conditions (Training & Protocol, Training & Protocol, and Follow-Up & Protocol) for either the number of quality indices $F(2,27) = 1.70, ns$ or the total level of quality $F(2,27) = 1.31, ns$.

Additional training provided through a 2-hour follow-up session did not improve the intervention quality as compared to those interventions implemented after the full-day training session only. As with the second phase conditions, the number of quality indices for the third phase cases was approaching the ceiling of 9—an average of 8.13 indicators was present. Likewise, the total level of quality was not near the ceiling of 45 with a mean of 29.27 for third phase cases.

Table 6. Mean number of quality indices present and post hoc analyses for 2nd phase conditions (Repeated Baseline, Protocol Only, Training & Protocol)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean NQI</th>
<th>$F$</th>
<th>Post Hoc$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeated Baseline ($n = 19$)</td>
<td>6.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protocol Only ($n = 10$)</td>
<td>8.30</td>
<td>22.09****</td>
<td>B&lt;P=T</td>
</tr>
<tr>
<td>Training &amp; Protocol ($n = 19$)</td>
<td>8.37</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scheffe's test. Student-Newman-Keuls, a less stringent post-hoc statistic yielded similar results.

****p<.0001
Table 7. Mean total level of quality and post hoc analyses for 2nd phase conditions (Repeated Baseline, Protocol Only, Training & Protocol)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean TLQ</th>
<th>F</th>
<th>Post Hoc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeated Baseline (n = 19)</td>
<td>20.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protocol Only (n = 10)</td>
<td>29.80</td>
<td>16.21****</td>
<td>B&lt;P=T</td>
</tr>
<tr>
<td>Training &amp; Protocol (n = 19)</td>
<td>31.21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Scheffe's test. Student-Newman-Keuls, a less stringent post-hoc statistic yielded similar results.

****p<.0001

**Training Versus No Training**

Simple comparisons between those cases completed without training (Baseline and Protocol Only phases combined) and those with training (Training & Protocol and Follow-Up & Protocol phases combined) found significant increases in quality as a result of the training: number of quality indices \( t = -7.93, p < .001 \) and total level of quality \( t = -7.88, p < .001 \). These results are shown in Table 8. In other words, those interventions implemented after practitioners were trained in the nine quality indices contained more quality indicators \( M = 8.22 \) with a higher level of quality \( M = 30.02 \) than those interventions implemented prior to being trained \( M = 6.15 \) and \( M = 21.38 \), respectively. While training in designing and implementing quality interventions appears to be a benefit, the Intervention Documentation Protocol was used in all training cases. The post-hoc analysis of mean differences between second phase conditions referred to in Tables 6 and 7 found the use of the protocol alone was enough to improve intervention quality—training had no added benefit. Therefore, the interpretation of the results in Table 8 may not reflect an accurate picture of the “training” impact as part of protocol-based training.
Table 8. Comparison of quality measures across non-training and training phases

<table>
<thead>
<tr>
<th></th>
<th>No Training Mean (n = 96)</th>
<th>Training Mean (n = 49)</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Quality Indices</td>
<td>6.15</td>
<td>8.22</td>
<td>-7.93***</td>
</tr>
<tr>
<td>Present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Level of Quality</td>
<td>21.38</td>
<td>30.02</td>
<td>-7.88***</td>
</tr>
</tbody>
</table>

***p < .001

Effect of the Protocol

To determine the effect of the protocol on the intervention quality, comparisons of the mean number of quality indices and the total level of quality were made between conditions within the second phase of the treatment sequence (Baseline—Protocol Only—Training & Protocol), and between those conditions involving the use of the protocol and those that did not (Protocol Only, Training & Protocol, and Follow-Up & Protocol versus Baseline). ANOVAs were calculated for comparisons among phase conditions. T-tests were calculated for comparisons between those cases completed using the protocol and those that did not use the protocol.

Post-hoc results presented in Tables 6 and 7 indicate significant differences in quality between those cases implemented during the Protocol Only phase and those implemented during the Repeated Baseline phase: number of quality indices $F(2,45) = 22.09, p < .001$ and total level of quality $F(2,45) = 16.21, p < .001$. Repeated Baseline cases contained fewer quality indicators ($M = 6.05$) with a lower level of quality ($M = 20.11$) than Protocol Only cases ($M = 8.30$ and $M = 29.80$, respectively).

Likewise, simple comparisons between those cases completed without using the protocol and those with the protocol also found significant increases in quality on both
measures: number of quality indices $t = -10.14$, $p < .001$ and total level of quality $t = -9.79$, $p < .001$ (See Table 9). Those interventions documented using the prescribed Intervention Documentation Protocol had more quality indices present ($M = 8.24$) with a higher level of quality ($M = 29.99$) than those interventions documented using other methods of documentation chosen by the practitioner ($M = 5.90$ and $M = 20.40$, respectively).

Table 9. Comparison of quality measures with and without use of the protocol

<table>
<thead>
<tr>
<th>No Protocol Mean</th>
<th>Protocol Mean</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 86)</td>
<td>(n = 59)</td>
<td></td>
</tr>
<tr>
<td>Number of Quality Indices Present</td>
<td>5.90</td>
<td>8.24</td>
</tr>
<tr>
<td>Total Level of Quality</td>
<td>20.40</td>
<td>29.99</td>
</tr>
</tbody>
</table>

***$p < .001$

Relation Between Quality and Student Outcomes

Correlation coefficients were calculated to examine the relation between the quality of the intervention—the number of quality indices, the total level of quality, and each individual component—and student outcomes represented through practitioners' rating, teachers' rating, visual analysis score, and experts' rating. Recall that the practitioners' and teachers' ratings were self-report measures and may or may not have been based on the data. The visual analysis score was based solely on the data using Kazdin's (1982) four characteristics of visual analysis. The experts' ratings incorporated those visual analysis decision making rules along with the expert's knowledge of the type of behavior, expected rates of change, developmental norms, and other factors they deemed relevant.
Overall Quality

Table 10 contains the Pearson’s R correlations suggesting a positive relation between the quality of the intervention (as indicated by both the number of quality indices present and the total level of quality) and the outcome of the intervention based on visual analyses scores ($r = .29$ and $.35$, respectively) or expert ratings ($r = .51$ and $.55$, respectively). When more quality indicators are present and with a higher level of quality, interventions lead to more positive student outcomes based on the progress monitoring data. For the most part, there is not a significant relation between quality and student outcome based on self-report ratings from practitioners and teachers. As noted previously, these ratings may or may not have been based on the progress monitoring data.

Due to differences in the relation between quality and the various outcome ratings, these findings suggest that those persons directly involved in the design and implementation of the intervention use other factors in place of or in addition to the progress monitoring data to judge the outcome of the intervention—practitioners’ and teachers’ ratings do not correlate as highly to data-based positive student outcomes compared to those ratings based solely on the visual analysis of the progress monitoring data. Likewise, the experts’ ratings appear to be based on more than just the visual analysis of data as indicated by a stronger relation between intervention quality and student outcome than that found between the visual analysis score and student outcome.
Table 10. Pearson's R correlations between quality of intervention and student outcome ratings

<table>
<thead>
<tr>
<th></th>
<th>Number of Quality Indices Present</th>
<th>Total Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practitioner Rating(^a)</td>
<td>.11</td>
<td>.18*</td>
</tr>
<tr>
<td>Teacher Rating(^b)</td>
<td>.08</td>
<td>.13</td>
</tr>
<tr>
<td>Visual Analysis Score(^c)</td>
<td>.29**</td>
<td>.35***</td>
</tr>
<tr>
<td>Expert Rating(^d)</td>
<td>.51****</td>
<td>.55****</td>
</tr>
</tbody>
</table>

\(^a\) Practitioner Rating: 4 = Problem resolved; 3 = Progress being made, continuing with plan; 2 = Problem not resolved, redesigning or modifying the intervention; 1 = Problem not resolved, determining entitlement for special education.

\(^b\) Teacher Rating: 4 = Desired level of progress achieved. Problem resolved. 3 = Acceptable level of progress achieved. Continuing with the plan. 2 = Progress is slow or has come to a halt. Redesigning or modifying the intervention. 1 = No progress or the problem is getting worse. Seeking addition resources.

\(^c\) Visual Analysis Score = Number of "yes" responses to Change in Mean?, Change in Trend?, Change in Level?, and Latency of Change?

\(^d\) Expert Rating: 4 = Student performance improved greatly, this intervention was highly effective; 3 = Student performance improved but not greatly, this intervention was somewhat effective; 2 = Student performance did not change, this intervention was not effective; 1 = Student performance got worse, this intervention was not effective; 0 = There is not enough information to rate the effectiveness of the intervention.

* \(p < .05\)
** \(p < .01\)
*** \(p < .001\)
**** \(p < .0001\)

Individual Intervention Components

Spearman’s rank correlation coefficients, formerly referred to as Spearman’s rho, were calculated between each of the nine quality indices and the four outcome ratings. Results are presented in Table 11. Based on practitioners’ ratings, a significant relation was found between student outcome and three intervention components: behavioral definition, \(r_s = .25\);
intervention plan, $r_i = .28$; and treatment integrity, $r_i = .30$. Only one quality indicator—intervention plan—was significantly related to positive student outcomes according to teachers' ratings ($r_i = .19$). The visual analysis score was significantly correlated with behavioral definition ($r_i = .26$), baseline data ($r_i = .42$), goal setting ($r_i = .23$), treatment integrity ($r_i = .21$), progress monitoring ($r_i = .26$), and program evaluation ($r_i = .38$). For experts' ratings, all nine quality indices were correlated with positive student outcomes with correlations ranging from .26 to .50.

Table 11. Spearman's rank correlations between quality indicators and student outcome ratings.

<table>
<thead>
<tr>
<th>Quality Indicator</th>
<th>Practitioner Rating</th>
<th>Teacher Rating</th>
<th>Visual Analysis Score</th>
<th>Expert Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Definition</td>
<td>.25**</td>
<td>.09</td>
<td>.26**</td>
<td>.33***</td>
</tr>
<tr>
<td>Baseline Data</td>
<td>.14</td>
<td>.14</td>
<td>.42***</td>
<td>.50***</td>
</tr>
<tr>
<td>Problem Validation</td>
<td>.03</td>
<td>-.00</td>
<td>.13</td>
<td>.39***</td>
</tr>
<tr>
<td>Functional Analysis</td>
<td>.02</td>
<td>-.04</td>
<td>.08</td>
<td>.26**</td>
</tr>
<tr>
<td>Goal Setting</td>
<td>.11</td>
<td>.11</td>
<td>.23*</td>
<td>.32***</td>
</tr>
<tr>
<td>Intervention Plan</td>
<td>.28**</td>
<td>.19*</td>
<td>.17</td>
<td>.40***</td>
</tr>
<tr>
<td>Treatment Integrity</td>
<td>.30***</td>
<td>.16</td>
<td>.21*</td>
<td>.35***</td>
</tr>
<tr>
<td>Progress Monitoring</td>
<td>.07</td>
<td>.13</td>
<td>.26**</td>
<td>.33***</td>
</tr>
<tr>
<td>Program Evaluation</td>
<td>.01</td>
<td>.08</td>
<td>.38***</td>
<td>.39***</td>
</tr>
</tbody>
</table>

* $p < .05$

** $p < .01$

*** $p < .001$
Summary

This study examined the validity of best practices in intervention design and implementation using objective, permanent product indices of intervention quality. It also assessed the effect of a protocol and training on intervention quality and outcomes. Results would suggest interventions still are not being implemented with the level of quality which reflects “best practice” standards. In addition, interventions are not leading to highly positive student outcomes on a consistent basis. This study found the following results regarding the three research questions and hypotheses (numbered according to the specific research questions and hypotheses):

1. Interventions designed and implemented after training in "best practices" contained more quality indicators with a higher level of quality than those implemented and designed before training. However, there were no differences between varied levels of training.

2. Interventions developed on the Intervention Documentation Protocol denoting the nine quality indicators did contain more quality indicators with a higher level of quality than those developed on other intervention documentation materials. In addition, the use of the protocol alone resulted in similar improvements in intervention quality as those found with the use of training and the protocol.

3. When student outcomes are data-based, there is a positive relation between the intervention quality and intervention outcome: (a) those interventions implementing more quality indicators led to more positive student outcomes according to visual analyses and expert ratings; and (b) those interventions with a higher level of quality led to more positive student outcomes according to practitioner ratings, visual analyses, and expert ratings. Teachers' ratings of student outcomes were unrelated to the intervention quality.
CONCLUSIONS

This study supports the use of protocol-based training in improving intervention quality and validates recommended “best practice” in designing and implementing quality interventions. Training in designing and implementing interventions which incorporated an intervention documentation protocol outlining quality indices resulted in higher quality interventions than those designed and implemented prior to the training. The “protocol-based” aspect of the training may have been the critical piece, since the use of the intervention documentation protocol alone resulted in improvements equal to those attained with the protocol and training. Those interventions with higher levels of quality led to more positive student outcomes.

In addition to overcoming many of the limitations of previous research (i.e., Flugum, 1992; Flugum & Reschly, 1994), this study provides a more positive view of current practices. Flugum’s previous research found less than optimal implementation of the intervention components: 42%-53% of the cases contained a behavioral definition, 34%-41% collected baseline data, 47%-55% had a written intervention plan, 73%-75% reported the intervention was implemented as planned, 2%-6% graphed intervention results, and 9%-13% made comparisons of results to baseline. With the exception of treatment integrity (0%-76%), the current study found improved, yet still not optimal, implementation of quality indicators: 87%-97% of the cases contained a behavioral definition, 47%-100% collected baseline data, 21%-100% validated the problem, 61%-95% conducted a functional analysis of the problem, 94%-100% set a goal, 92%-100% had a written intervention plan, 79%-97% monitored progress, and 75%-100% evaluated intervention results.

The current research also should be compared to results from prior training efforts by McDougall, Reschly & Corkery (1988) and the Relevant Educational Assessment and Intervention Model (RE-AIM) as summarized by Reschly and Flugum (1993). Previous research obtained lower levels of implementation prior to training for both behavioral
definition (47% and 42%) and goal setting (6% and 9%), than levels obtained in this study—87%-90% for behavioral definition and 94%-100% for goal setting. After training, McDougall et al. and the current study obtained similar levels of implementation for behavioral definition (91% and 92%-97%, respectively), with Reschly and Flugum’s findings being lower (75%). This study obtained much higher rates of goal setting after training (95%-100%) than those found in McDougall et al.’s and the RE-AIM study, 59% and 45% respectively.

This study’s findings are comparable to results from a similar research effort in Ohio (Telzrow, 1998). Telzrow looked at eight of the nine “best practices” intervention components—problem validation was excluded—and their impact on student goal attainment. Telzrow rated the components using a 5-point Likert-scale similar to that used in this dissertation for level of quality: 1 = no elements were evident, 3 = some elements were present, 5 = all elements were indicated. Telzrow obtained the following ratings for each component: behavioral definition of problem, $M = 4.33$; baseline data, $M = 3.16$; clearly identified goal, $M = 3.96$; hypothesized reason for problem, $M = 2.18$; systematic intervention plan, $M = 3.40$; treatment integrity, $M = 2.60$; data indicating student response to intervention, $M = 3.49$; and comparison of student performance with baseline, $M = 3.09$. In the current study, similar, but not optimal, results were found: behavioral definition, $M = 2.87$ (SD 1.24); baseline data, $M = 2.26$ (SD 1.32); problem validation, $M = 2.83$ (SD 1.81); functional analysis, $M = 2.19$ (SD 1.09); goal setting, $M = 2.88$ (SD 1.34); intervention plan, $M = 2.57$ (SD 0.96); treatment integrity, $M = 1.63$ (SD 1.16); progress monitoring, $M = 3.57$ (SD 1.34); and program evaluation, $M = 3.51$ (SD 1.31).

Telzrow (1998) also found statistically significant but modest correlations between six of the eight components and student goal attainment (a 5-point Likert-scale: 1 = evidence of student regression, 3 = progress remained the same, 5 = goal was achieved or exceeded): behavioral definition of problem, $r = .17$; baseline data, $r = .18$; clearly identified goal, $r =
.24; systematic intervention plan, $r = .13$; data indicating student response to intervention, $r = .20$; and comparison of student performance to baseline, $r = .16$. Two components, the hypothesized reason for the problem and treatment integrity, were not correlated with student goal attainment. Studies examining individual intervention components relation to student outcomes, however, have found stronger relations: (a) Bergan and Tombari (1976) - $R = .77$ between behavioral definition and problem resolution; (b) Gresham et al. (1993) - $r = .51$ between treatment integrity and effect size and $r = .58$ between treatment integrity and percentage of non-overlapping data points; and (c) Kaufman and Flicek (1995) - $r = .52$ between treatment integrity and intervention effectiveness.

Compared to Telzrow's results, stronger correlations were obtained in the current study. However, the number of significant correlations and the strength of those relations did vary by outcome measure, with the objective ratings (i.e., visual analysis score and expert raters) resulting in more significant findings. There were significant correlations between (a) all nine indicators and experts' ratings of outcome ($r_s = .26 -.50$), (b) six of the nine indices (behavioral definition, baseline data, goal setting, treatment integrity, progress monitoring, program evaluation) and visual analysis scores ($r_s = .21 -.42$), (c) three of the nine indices (behavioral definition, intervention plan, treatment integrity) and practitioners' ratings of outcome ($r_s = .25 -.30$); and (d) one of the nine indices (intervention plan) and teachers' ratings of outcome ($r_s = .19$).

Research efforts examining several intervention components—Flugum (1992); Flugum & Reschly (1994); Telzrow (1998) and the current study—support two basic conclusions. First, practitioners are not designing and implementing interventions that contain all the intervention components with the degree of quality recommended (Tilly & Flugum, 1995). Second, if practitioners' interventions contain Tilly and Flugum's nine components with a high level of quality, it is more likely the interventions will lead to positive student outcomes.
Protocol-Based Training

In efforts to improve the quality of interventions, protocol-based training did have a positive impact. However, the use of the protocol minus the training had similar effects—training had no added benefit. Additional support through a follow-up training also had no effect. An additional 2-hour session to review the intervention components and address practitioners' problems with designing and implementing quality interventions had no greater effect than simply using the Intervention Documentation Protocol. This study did not contain a phase where practitioners received the training minus the protocol, a condition that could have further clarified the value of this kind of training. Conclusions regarding the practitioners' generalization of the skills taught in training to their everyday method of intervention documentation cannot be made. Future research should include the training-without-protocol phase to further evaluate the individual effects of the training and the protocol, along with other training models and intervention documentation materials.

A protocol would appear to affect practitioners' performance, while training would appear to affect practitioners' skills. The use of the protocol that led practitioners through the specific components was enough to significantly improve intervention quality, suggesting that practitioners have the skills to design and implement quality interventions—they just were not doing so when using other methods of documentation. Poor implementation of the quality indicators appears to be a performance problem, not a skills problem.

In 1995-1996, Heartland Area Education Agency's requirements for interventions encompassed all nine quality indicators; however, they grouped them into five required components: (a) a written intervention plan, (b) a clear statement or description of the problem, (c) a problem analysis which leads to an intervention design, (d) a description of the actual intervention (including what is to be done, when, how, and by whom), and (e) a plan for measuring outcomes which can be used to make data based adjustments as needed during the course of the intervention (including a description of the measurement and
recording techniques, baseline or pre-treatment level of performance, monitoring schedule, and behavior levels at the predetermined monitoring times) (Heartland AEA, 1995). Likewise, the agency’s recommended intervention documentation forms did not delineate all nine components (refer to Appendix E). Even if the practitioners had the skills to design and implement quality interventions, the agency’s protocol appears insufficient in prompting desired practitioner behaviors.

At the time of the project, Heartland Area Education Agency’s evaluation of staff did not include comparisons of practitioners’ interventions to agency requirements. A poor evaluation for not designing and implementing quality interventions—a disincentive—was not a possibility based on the evaluation criteria. It is possible Heartland’s procedures did not provide the right incentives to encourage the design and implementation of high quality interventions.

More recently, Heartland Area Education Agency’s procedural manual, recommended paperwork and staff evaluation criteria have placed greater emphasis on designing and implementing quality interventions requiring nine components: statement of the problem or behavioral definition; goal written in observable, measurable terms; parental participation; level of performance before intervention; procedures and arrangements; measurement strategy; decision making plan; present level of performance after intervention; and summary of outcome data (Heartland AEA, 1997). The recommended intervention plan provides headings and descriptions of six of the nine quality indicators: behavioral definition, baseline data, goal, intervention plan, progress monitoring, and program evaluation (see Appendix P). It is possible that intervention quality has continued to improve simply based on these policy changes. Future research should be conducted to test this hypothesis.

Since ceilings were not met for either the number of quality indices present or the level of quality, a need for continued skill development exists. Based on these findings, a one-day protocol-based training with examples and practice opportunities with an added 2-hour
follow-up session for review and questions was not adequate in obtaining recommended
"best practice" interventions. More intensive training conditions employing close and direct
coaching and feedback may be required to achieve desired results (Kratochwill, Elliott &
Busse, 1995). Kratochwill et al. found competency-based training procedures including
reading assignments, observations of videotaped exemplars, seminars, videotaped/
audiotaped practice, self-evaluation, and supervision and feedback over a course of two to
three months was an effective training method to increase knowledge and implementation of
behavioral consultation.

The author agrees with two hypotheses made by Telzrow (1998): (a) the skills
necessary to implement certain intervention components are more complex and require more
intense training than other components; and (b) some intervention components simply lend
themselves better to the task of written documentation than other components. Based on the
results of this study—both presence of quality indicators and level of quality—functional
analysis and treatment integrity would appear to fall into those categories. Both components
are time consuming to implement and would require a great deal of writing to document.
The “best practice” description from the Quality Indicators Innovation Configurations
(Appendix O) provides some support for this statement. Functional Analysis involves the
examination of alterable factors from curriculum, instruction, the environment, and student
domains using a variety of procedures (review, interview, observe, and test) to collect data
from a variety of relevant sources and settings; this information is used to develop a specific
intervention plan to change the behavior. Treatment Integrity requires the measuring and
monitoring of the plan to ensure it is implemented as designed, including the decision-
making rules; the intervention is changed or modified as necessary on the basis of objective
data. Efforts should continue to determine how these two quality indicators can best be
trained and documented to ensure adequate implementation.
Relation Between Quality Indicators and Outcomes

There is a positive relation between intervention quality and student outcome. There also is a positive relation between the majority of the individual quality indicators and student outcome. These two statements, however, hold true only when student outcomes are based on visual analysis and expert ratings, not ratings from those persons directly involved in designing and implementing the interventions. These results could suggest one of three things: (a) The progress monitoring data do not reflect student behavior accurately; (b) Practitioners and teachers are not using data to make decisions for students; or (c) Practitioners and teachers are not using these progress monitoring data to make decisions, but rather a broader set of data. Either way a need for additional training exists—teachers and practitioners need further skill building in (a) defining the correct target behavior and identifying a valid progress monitoring system, or (b) making decisions for students based on progress monitoring data. These results also raise questions about the use of teachers’ impressions or judgments of intervention outcomes.

The lack of a significant relation between student outcome and self-report ratings also may be due to the actual ratings used. The teachers’ and practitioners’ ratings did not compare directly to each other or to the other two outcome ratings. Future research should attempt to use the same outcome ratings and to disentangle the different bases for teacher and practitioner outcome ratings.

The relation between intervention quality and the two ratings based on objective ratings, while both significant, varied in strength. Experts’ ratings resulted in stronger relations between overall quality and individual quality indicators than the use a visual analysis score alone. While this might suggest experts use more than just visual analysis of the data in judging student outcome, it also may be that experts take into account Gresham and Noell’s (1993) belief that visual analysis is a conservative measure of outcome.
The limited variance in intervention quality might be another reason for insignificant findings and weak relations. If more interventions had been implemented with higher levels of quality (i.e., approaching recommended best practice), stronger relations may have been found between student outcomes and intervention quality—both overall quality and individual quality indicators.

**Future Directions**

Results of this study provide the basis for three suggestions for educational agencies to improve practice in designing and implementing quality interventions. First, the content of paperwork should be evaluated to ensure the necessary components of quality interventions are included. The use of a protocol similar to that used in this study which guides practitioners through the specific steps appears to have a positive impact on effective practice. Current results support the need for all nine quality indicators to be present for positive student outcomes. Further research, however, is needed to determine which specific components are crucial to achieve desired outcomes.

The second implication for practice involves the need for additional training. This study supports the use of protocol-based training, however, more intensive training models may be required to ensure implementation of recommended “best practices.” The common method of training—one-day with or without a brief follow-up—does not appear to be adequate. Training models involving more hours, modeling, coaching, and feedback may be necessary to improve practitioners’ skills to the desired level of quality. An emphasis should be placed on decision-making, specifically how to use progress monitoring data to make educational decisions for students (formative evaluation).

Finally, educational agencies need to improve compliance monitoring and incentives for designing and implementing quality interventions. If the intent of staff evaluation is to guide practice, evaluation criteria should be focused on what the agency deems critical for effective practice. If the goal is for positive student outcomes, this research would suggest the need to
implement quality interventions. To accomplish this, there is a need to enhance agency
evaluations of staff implementation of problem solving components.

Protocol-based training can improve intervention quality, but the detailed intervention
documentation materials and not the training may be the cause of the improved practice.
While there continues to be room for improvement in intervention quality, when
interventions are designed and implemented following "best practices," the results of the
present study would indicate positive student outcomes.
APPENDIX A. EXTENDED PROBLEM SOLVING: GENERAL CONFIGURATION
### EXTENDED PROBLEM SOLVING: GENERAL CONFIGURATION

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>(1) The problem statement contains a specific, observable &amp; measurable target behavior. Behavior dimensions &amp; degree of discrepancy based on local standards are specified.</td>
<td>(1) Multi-dimensional assessment procedures are used to collect problem-centered data that provides a quantitative &amp; qualitative description of a discrepancy, examines alterable factors in 4 domains &amp; is useful for designing a specific, individualized intervention.</td>
<td>(1) IAP has internal consistency, specific objectives, implementation steps &amp; a progress monitoring plan.</td>
<td>(1) Plan is implemented as designed with planned, ongoing trouble shooting; decisions are made on data that is gathered regularly &amp; frequently.</td>
<td>(1) Parent is invited to participate at all decision-making points; documentation is included; parent participates.</td>
</tr>
<tr>
<td>(2) The problem statement contains a specific, observable, &amp; measurable target behavior. Behavior dimensions &amp; degree of discrepancy based on non-local standards are specified.</td>
<td>(2) Multi-dimensional assessment procedures are used to collect standard data that provides a description of a discrepancy, examines student characteristics &amp; some limited setting demands, &amp; is used to select an intervention.</td>
<td>(2) IAP has internal consistency, specific objectives, implementation steps. There is no objectives and no progress monitoring plan.</td>
<td>(2) Plan is implemented with unplanned trouble shooting; decisions are made on data that is gathered regularly &amp; frequently.</td>
<td>(2) Parent is invited to participate at all decision-making points; documentation is included; parent chooses not to participate.</td>
</tr>
<tr>
<td>(3) The problem statement contains a specific, observable, &amp; measurable target behavior. The dimensions of the behavior are defined.</td>
<td>(3) Multi-dimensional assessment procedures are used to collect standard data that provides a description of a discrepancy, examines student characteristics only, &amp; is solely used for eligibility &amp; placement decisions.</td>
<td>(3) IAP has internal consistency &amp; implementation steps. There are no objectives and no progress monitoring plan.</td>
<td>(3) Plan is implemented with unplanned trouble shooting; decisions are made on data that is gathered irregularly &amp; infrequently.</td>
<td>(3) Parent informed; documentation included.</td>
</tr>
<tr>
<td>(4) The problem statement contains a specific, observable, &amp; measurable target behavior. The dimensions of the behavior are not defined.</td>
<td>(4) A limited number of assessment procedures are used to collect standard data that examines student characteristics only, &amp; is solely used for eligibility &amp; placement decisions.</td>
<td>(4) IAP has internal consistency, specific objectives. There are no objectives, implementation steps or progress monitoring plan.</td>
<td>(4) Plan is implemented with no trouble shooting; decisions are made on teacher perceptions.</td>
<td>(4) Parent neither informed nor invited to participate.</td>
</tr>
<tr>
<td>(5) The behavior in the problem statement is not stated in observable and measurable terms.</td>
<td>(5) A limited number of assessment procedures are used to collect standard data that examines student characteristics only, &amp; is solely used for eligibility &amp; placement decisions.</td>
<td>(5) IAP has internal consistency. There are no objectives, implementation steps or progress monitoring plan.</td>
<td>(5) Plan is not implemented. No trouble shooting or decision making takes place.</td>
<td>(5) Parent neither informed nor invited to participate.</td>
</tr>
</tbody>
</table>

(Descriptors to the left of the solid line are ideal as defined by the developer. Variations are right of the solid line; the further right, the less acceptable.)
APPENDIX B. FLOWCHART FOR EDUCATIONAL PROBLEM-SOLVING STEPS
Functional Analysis of Problem

Set Goals

Write Intervention Plan

Monitor Treatment Integrity

Data Collection and Summarization

Data Evaluation (Formative)

Should Current Intervention Be Continued Without Changes?

Yes

Reevaluate Problem Definition, Functional Analysis or Intervention Strategy

No

Is Performance Improving at an Acceptable Rate?

Yes

Data Evaluation (Summative)

Has the Goal Been Reached?

Yes

Program for Maintenance and Generalization

No

No

No
APPENDIX C. STUDENT IMPROVEMENT IS JOB #1 PROTOCOL
**Definition of Behavior**
(behavior— which is specific, observable, alterable and measurable— is defined through three examples and three nonexamples are provided)

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Nonexample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior happens too much or too little (Frequency)</td>
<td><em>Behavior</em> happens too long or too short (Duration)</td>
</tr>
<tr>
<td>Behavior doesn't happen correctly (Accuracy)</td>
<td><em>Behavior</em> usually occurs in inappropriate or inefficient (Topography)</td>
</tr>
<tr>
<td><em>Behavior</em> is too loud, forceful, or too soft, passive etc. (Intensity)</td>
<td></td>
</tr>
</tbody>
</table>

**Dimension of Behavior**
(What about the behavior is problematic?)

- Behavior happens too much or too little (Frequency)
- Behavior happens too long or too short (Duration)
- Behavior doesn't happen correctly (Accuracy)
- Behavior usually occurs in inappropriate or inefficient (Topography)
- Behavior is too loud, forceful, or too soft, passive etc. (Intensity)

**Behavior DISCREPANCY BEFORE Intervention**

- What is the student's current level of performance, the baseline? ____________ (A)
- What level of student performance would be acceptable? ____________ (B)
- What is the discrepancy between the level of A and B? ____________ (C)

**Standards:**
- Local norms
- Peer performance
- Criteria for the next environment
- Instructional placement standards
- Developmental standards
- Teacher expectation
- School board standards
- Medical
- Other (please specify)

**Intervention Considerations**

<table>
<thead>
<tr>
<th>Beginning Date</th>
<th>Direction of Change</th>
<th>Intervention Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Mo)</td>
<td>(D,M)</td>
<td>(Developmental, Supplemental, Generalization)</td>
</tr>
<tr>
<td>(Dy)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Yr)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Measurement Strategy**
(Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule—frequency of data collection per week)

**Behavior DISCREPANCY AFTER Intervention**

- What is the student's current level of performance? ____________ (A)
- What level of student performance would be acceptable? ____________ (B)
- What is the discrepancy between the level of A and B? ____________ (C)

**Standards:**
- Local norms
- Peer performance
- Criteria for the next environment
- Instructional placement standards
- Developmental standards
- Teacher expectation
- School board standards
- Medical
- Other (please specify)

**Outcome Data**

<table>
<thead>
<tr>
<th>Ending Date</th>
<th># Intervention Phases</th>
<th>Discrepancy Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Mo)</td>
<td>(Dy)</td>
<td>(Yr)</td>
</tr>
</tbody>
</table>

**Performance Conclusion**

(See code with five options below)

1. Goal met or exceeded: Trendline slope is at or greater than slope of the goal line.
2. Goal met, but performance improved: Trendline slope reflects improvement in performance, but at a rate less than that designated by goal line.
3. Goal met but performance did not improve or not met: Trendline slope reflects little or no change from baseline performance or is moving away from the goal in an undesirable direction.
4. Data not available, but the student is in school.
5. Data is not available, student has moved from school.
# Instructional Intervention Plan

## Decision Making Plan:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Instructional Procedures</th>
<th>Materials</th>
<th>Arrangements</th>
<th>Time</th>
<th>Motivational Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Skills and Strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Skills and Strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Skills and Strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Skills and Strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Skills and Strategies</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Student**

**Goal Area**
Student Improvement is Job #1: Goal Area

Student's Name: ____________________________ District: ____________________ School: ________________ School Year: ________ Teacher: ____________________________

Goal Statement: _______________________________________________________________________________________________________________________________________________________

Expected Level of Performance: Goal Criterion 1 (#) Quarterly Objective 1 (#) Quarterly Objective 2 (#) Quarterly Objective 3 (#) Quarterly Objective 4 (#) (Same as Goal Criterion)

Service: Primary Provider: ____________________________ Supporting Provider: ________________ Supporting Provider: ____________________________

Parent Participation: ____________________________________________________________________________

PROGRESS MONITORING GRAPH

[Graph with data points and lines indicating progress over time]

BASELINE

[Data points and lines indicating baseline performance]

M W T TH F SAT SUN

[Data points and lines indicating performance throughout the week]

RECOUP 1: RECOUP 2

[Data points and lines indicating recovery phases]

Page 73
APPENDIX D. HEARTLAND AEA'S SIX REGIONAL ZONES
Heartland Area Map of Community School Districts (Public)

Northern Zone
Southeastern Zone
Northeastern Zone
Middle Zone
Southwestern Zone
Western Zone
DSM School District

* = AEA 11 branch offices
APPENDIX E. HEARTLAND AEA'S 1995 INTERVENTION DOCUMENTATION FORMS
INTERVENTION DOCUMENTATION (Cover Page)

RECORD REVIEW

Previous schools attended:

Past areas of difficulty:

Past placements or services: Date Began: Date Ended:

School Attendance: Excellent Fair Poor
(Circle one)

Disciplinary Action Required: Yes No
(Circle one)

Documented health, vision, or hearing concerns? Yes No
(Circle one)

Comments:

Pertinent test scores:

ADDITIONAL INPUT

This may include input from the student, parent, previous teachers or other involved individuals.

(Complete Problem Analysis and Attach)

PROBLEM STATEMENT

Write a statement of the problem. The behavior must be one that can be measured.

BRAINSTORM POSSIBLE SOLUTIONS
# Problem Analysis (A)

Identify possible problem areas considering each of the following domains:

<table>
<thead>
<tr>
<th>Environment</th>
<th>Instruction</th>
<th>Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Look for possible mismatches

Is more information needed? If so, generate assessment questions.

<table>
<thead>
<tr>
<th>Assessment Question(s):</th>
<th>Person responsible:</th>
<th>Results:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Student's Name: ___________________________  District: ___________________________  Building: ___________________________  Page ___ of ___
<table>
<thead>
<tr>
<th>Antecedents</th>
<th>Problem Behaviors</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there situations that seem to set off the problem behavior?</td>
<td>What seems to be maintaining (reinforcing) the student's behavior?</td>
<td></td>
</tr>
<tr>
<td>Where and when do problems occur?</td>
<td>How long and how often do behaviors occur?</td>
<td>What occurs immediately after the behavior?</td>
</tr>
</tbody>
</table>

**Is more information needed? If so, generate assessment questions**

**Assessment Question(s):**

<table>
<thead>
<tr>
<th>Person responsible:</th>
<th>Results:</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>
PROBLEM ANALYSIS (C)

Identify possible problem areas considering each of the following domains.

<table>
<thead>
<tr>
<th>Known Information</th>
<th>Assessment Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environment</strong></td>
<td>Question:</td>
</tr>
<tr>
<td></td>
<td>Procedures:</td>
</tr>
<tr>
<td></td>
<td>Results:</td>
</tr>
<tr>
<td><strong>Instruction</strong></td>
<td>Question:</td>
</tr>
<tr>
<td></td>
<td>Procedures:</td>
</tr>
<tr>
<td></td>
<td>Results:</td>
</tr>
<tr>
<td><strong>Curriculum</strong></td>
<td>Question:</td>
</tr>
<tr>
<td></td>
<td>Procedures:</td>
</tr>
<tr>
<td></td>
<td>Results:</td>
</tr>
<tr>
<td><strong>Learner</strong></td>
<td>Question:</td>
</tr>
<tr>
<td></td>
<td>Procedures:</td>
</tr>
<tr>
<td></td>
<td>Results:</td>
</tr>
</tbody>
</table>
**PROBLEM ANALYSIS (D)**

<table>
<thead>
<tr>
<th>Assessment Question(s):</th>
<th>Person responsible:</th>
<th>Results:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

If more information needed? If so, generate assessment questions.
INTERVENTION PLAN

Date: ____________________

Intervention selected:

Goal statement:

Procedures:

Person(s) responsible: | Monitoring strategy:

Parental participation:

Results:
APPENDIX F. OUTCOME QUESTION FOR BASELINE AND RETURN TO BASELINE PHASES
INTERVENTION STUDY

Demographic Information

Gender: Male Female

Years of Experience in Your Profession: ____________

Highest Degree Held: Masters Specialist Doctorate Other ____________

Zone: Middle Northeastern Northern

Western Southeastern Southwestern

Practitioner Code: ____________

Phase Code: ____________

Outcome of Intervention

Please indicate the outcome of the intervention by checking one of the four options below

_____ Problem resolved

_____ Progress being made, continuing with plan

_____ Problem not resolved, redesigning or modifying the intervention

_____ Problem not resolved, determining entitlement for special education

Attach to and submit with other intervention documentation materials.
APPENDIX G. INTERVENTION DOCUMENTATION PROTOCOL
Intervention Documentation

Student's Name: ___________  Grade: _____  B.D.: ___________
Teacher(s): ___________  District/Building: ___________
Parent(s): ___________  Phone: (H) ___________ (W) ___________
Case Coordinator: ___________

**Definition of Behavior** [Behavior is defined then three examples and three nonexamples are provided]

**Baseline Data and Problem Validation**

**Dimension of Behavior** [What about the behavior is problematic?]
- Behavior happens too much or too little (Frequency)
- Behavior happens too long or too short (Duration)
- Behavior doesn't happen correctly (Accuracy)
- Behavior takes too long to begin after a prompt (Latency)
- Behavior occurs but is inappropriate or inefficient (Topography)
- Behavior is too loud, forceful, or too soft, passive etc. (Intensity)

Behavior Discrepancy BEFORE Intervention
- What is the student's current level of performance, the baseline? ___________ (A)
- What level of student performance would be acceptable? ___________ (B)
- What is the discrepancy between the level of A and B? ___________ (C)
- What standard is used to determine the acceptable level of performance in Item B: ___________

**Functional Analysis** [Summary of method (e.g., ABC, SORKC) and findings (e.g., antecedents, consequences, setting)]

**Goal** [Specify time, condition, behavior, and criterion]
## Intervention Plan

**Intervention Selected:** [Specify procedures, materials, who, when, and where below]

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Materials</th>
<th>Who</th>
<th>When</th>
<th>Where</th>
</tr>
</thead>
</table>

## Decision Making Plan
[Frequency of data collection, strategies to be used to summarize data for evaluation, number of data points or length of time before data analysis, decision rule]

## Treatment Integrity
[Summary of treatment integrity observations or checklists]
Progress Monitoring and Formative Evaluation

Measurement Strategy [Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]

Graph or Chart

Summative Evaluation

Behavior Discrepancy AFTER Intervention

- What is the student's current level of performance? __________________________ (A)
- What level of student performance would be acceptable? _______________________ (B)
- What is the discrepancy between the level of A and B? __________________________ (C)

- What standard is used to determine the acceptable level of performance in Item B: __________________________
  Standards: • Local norms • Peer performance • Criteria for the next environment • Instructional placement standards • Developmental standards • Teacher expectation • School policy/standards • Medical • Other—please specify

Outcome Data

Check one: ______ Problem resolved
            ______ Progress being made, continuing with plan
            ______ Problem not resolved, redesigning or modifying the intervention
            ______ Problem not resolved, determining entitlement for special education
APPENDIX H. TRAINING MANUAL
Designing and Implementing Interventions

Intervention Study Training for Extended Problem-Solving (Level III)

Kristi R. Flugum
Heartland Area Education Agency 11

1995
Agenda

Overview

Components of an Intervention
  Overview
  Format
  Example
  Practice

Case Examples
  Academic
  Non-academic

Additional Practice

Questions

Directions for this Phase
  Distribution of Materials
What is an Intervention?

INTERVENTION—
a planned modification of the environment made for the purpose of altering behavior in a pre-specified way

3 Components of the Definition

1) *Planful*—the procedures to be applied are specified clearly and completely

2) *Environmentally Focused*—the actions taken modify the environment, not the individual

3) *Goal Directed*—the behavior is altered in a pre-specified way
9 Components of an Intervention

Behavioral Definition
Baseline Data
Problem Validation
Functional Analysis
Goal Setting
Intervention Plan
Treatment Integrity
Progress Monitoring
Program Evaluation
Behavioral Definition

Overview

*Behavioral Definition* = a description of the behavior of concern or target behavior in specific, objective, and measurable terms.

The definition should be:

- *Objective*, referring only to observable characteristics of the behavior or environmental events, translating any inferential terms (such as "expressing hostile feelings," "intended to help," or "showing interest in") into more objective ones.

- *Clear*, being readable and so unambiguous that it could be read, repeated, and paraphrased by observers.

- *Complete*, delineating both examples and non-examples of the behavior so that differences between occurrences and non-occurrences of the behavior can be discerned.

Format

(Target behavior) means that (Target student) (Action verbs). Examples of (Target behavior) include (1) __________, (2) __________, (3) __________. Non-examples of (Target behavior) include (1) __________, (2) __________, (3) __________.
Example

**Definition of Behavior** [Behavior is defined then three examples and three nonexamples are provided]

Aggressive behavior means that Susie touches another person in a way that causes pain or discomfort. Examples include yanking, jerking, pulling, pushing, slapping, hitting, and pinching. Non-examples include rough physical contact that occurs as part of PE or recess, accidentally tripping on an object and pushing a student while falling to the ground, or pulling a peer out of the path of another student or object to avoid their being hit.

Practice

Write a behavioral definition for "noncompliance" in the space provided:

**Definition of Behavior** [Behavior is defined then three examples and three nonexamples are provided]
Baseline Data

Overview

*Baseline Data* = repeated measurement of the target behavior prior to implementing the intervention to determine the student's current level of performance

3 Steps:

1. Identify the appropriate dimension using the acronym FLITAD:

   *Frequency*—the number of times the behavior occurs

   *Latency*—the elapsed time from the presentation of a stimulus and the response or behavior

   *Intensity*—the strength or force with which a behavior is expressed

   *Topography*—the configuration, form or shape of a response or behavior

   *Accuracy*—the extent to which the behavior meets standards or is correct

   *Duration*—the length of time that passes from onset to offset of a behavior
Develop a measurement strategy by answering the following questions:

1. How will the data be collected?
2. What materials will be used to collect data?
3. In which setting(s) will data be collected?
4. Who will be responsible for collecting the data?
5. When (and how often) will the data be collected?

Collect the data prior to implementing the intervention.

- Repeated measures until a stable range of behavior has been identified (e.g., no new highs or lows for three data points in a row)
Example

Baseline Data and Problem Validation

**Dimension of Behavior** [What about the behavior is problematic?]

- Behavior happens too much or too little (Frequency)
- Behavior happens too long or too short (Duration)
- Behavior doesn’t happen correctly (Accuracy)
- Behavior takes too long to begin after a prompt (Latency)
- Behavior occurs but is inappropriate or inefficient (Topography)
- Behavior is too loud, forceful, or too soft, passive etc. (Intensity)

**Behavior Discrepancy BEFORE Intervention**

- What is the student’s current level of performance, the baseline? __________ (A)
- What level of student performance would be acceptable? __________ (B)
- What is the discrepancy between the level of A and B? __________ (C)

**Standards:**
- Local norms
- Peer performance
- Criteria for the next environment
- Instructional placement standards
- Developmental standards
- Teacher expectation
- School policy/standards
- Medical
- Other—please specify

Progress Monitoring and Formative Evaluation

**Measurement Strategy** [Who’s responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]

**Baseline:** For the next week (5 school days), for the first five directions given, Billie’s classroom teacher will start the timer immediately after she gives a direction to the class. As soon as Billie begins the behavior she was directed to do, the teacher will stop the timer and record the number of minutes it took Billie to follow the direction. At the end of the day, the average number of minutes will be recorded.

**Graph or Chart**

(See Attached)
Practice

Complete the three steps for baseline data for a reading concern:

Baseline Data and Problem Validation

<table>
<thead>
<tr>
<th>Dimension of Behavior [What about the behavior is problematic?]</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Behavior happens too much or too little (Frequency)</td>
</tr>
<tr>
<td>• Behavior happens too long or too short (Duration)</td>
</tr>
<tr>
<td>• Behavior doesn't happen correctly (Accuracy)</td>
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</tr>
</tbody>
</table>

Behavior Discrepancy BEFORE Intervention

- What is the student's current level of performance, the baseline? (A)
- What level of student performance would be acceptable? (B)
- What is the discrepancy between the level of A and B? (C)

Standards:
- Local norms
- Peer performance
- Criteria for the next environment
- Instructional placement standards
- Developmental standards
- Teacher expectation
- School policy/standards
- Medical
- Other—please specify

Progress Monitoring and Formative Evaluation

Measurement Strategy [Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]
Problem Validation

Overview

*Problem* = the difference between what is expected in an environment and what actually occurs

Performance standards options

- Typical peer performance
  - *Classroom norms*
  - *Peer comparison data*

- Expert judgment
  - *Teacher expectations*
  - *Instructional placement standards*
  - *School policy/standards*
  - *Criteria for next environment*

- Norms
  - *Local norms*
  - *Developmental norms*

2 Questions:

1. *Is there a discrepancy between the target student's performance and the performance standard?*

2. *If a discrepancy exists, is it large enough to warrant intervention?*
### Example

#### Baseline Data and Problem Validation

<table>
<thead>
<tr>
<th>Dimension of Behavior</th>
<th>What about the behavior is problematic?</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Behavior happens too much or too little</td>
<td></td>
</tr>
<tr>
<td>(Topography)</td>
<td>latency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Behavior happens too long or too short</td>
<td></td>
</tr>
<tr>
<td>(Intensity)</td>
<td>duration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Behavior doesn’t happen correctly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>latency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Behavior takes too long to begin after</td>
<td></td>
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<tr>
<td></td>
<td>latency</td>
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<td></td>
<td>inefficient</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Behavior is too loud, forceful, or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>too soft, passive etc.</td>
<td></td>
</tr>
</tbody>
</table>

#### Behavior Discrepancy BEFORE Intervention

- What is the student’s current level of performance, the baseline?  
  **68 WRC (4th grade)** (A)

- What level of student performance would be acceptable?  
  **133 WRC** (B)

- What is the discrepancy between the level of A and B?  
  **70 WRC** (C)

#### Standards:
- Local norms
- Peer performance
- Criteria for the next environment
- Instructional placement standards
- Developmental standards
- Teacher expectation
- School policy/standards
- Medical
- Other—please specify
Practice

Determine the standard and expected level of performance for self-abusive behavior (i.e., picking, pinching, hitting, scratching oneself).

Then answer the two questions: (1) Is there a discrepancy? (2) If yes, does it warrant intervention?

<table>
<thead>
<tr>
<th>Baseline Data and Problem Validation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimension of Behavior</strong> [What about the behavior is problematic?]</td>
</tr>
<tr>
<td>• Behavior happens too much or too little (Frequency)</td>
</tr>
<tr>
<td>• Behavior happens too long or too short (Duration)</td>
</tr>
<tr>
<td>• Behavior doesn't happen correctly (Accuracy)</td>
</tr>
<tr>
<td>• Behavior takes too long to begin after a prompt (Latency)</td>
</tr>
<tr>
<td>• Behavior occurs but is inappropriate or inefficient (Topography)</td>
</tr>
<tr>
<td>• Behavior is too loud, forceful, or too soft, passive etc. (Intensity)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Behavior Discrepancy BEFORE Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What is the student's current level of performance, the baseline? (A)</td>
</tr>
<tr>
<td>• What level of student performance would be acceptable? (B)</td>
</tr>
<tr>
<td>• What is the discrepancy between the level of A and B? (C)</td>
</tr>
<tr>
<td>• What standard is used to determine the acceptable level of performance in Item B:</td>
</tr>
<tr>
<td><strong>Standards:</strong>  • Local norms  • Peer performance  • Criteria for the next environment  • Instructional placement standards  • Developmental standards  • Teacher expectation  • School policy/standards  • Medical  • Other—please specify</td>
</tr>
</tbody>
</table>
Functional Analysis

Overview

*Functional Analysis* = a scientific method designed to discover the functional relation between the problem behavior and the variables that influence or control it

Functional Assessment = *gathering information*

RIOT model: Review, Interview, Observe, Test

Interviews
Rating scales and checklists
Observations

Possible Observational Methods:

**Sequence or ABC model**—events described in a narrative recording or a behavior observation are organized and categorized as sequences of antecedents, behaviors, and consequences

**Scatterplot method**—behavior is observed using frequency counts in specified time intervals attempting to display periods during which the behavior virtually never occurs or occurs with near certainty

**SORKC model**—observations are made of the stimuli in the environment (S), organismic variables influencing the behavior (O), the response or behavior itself (R), the contingencies or rules of reinforcement (K), and the consequences functionally related to the behavior (C)
**Functional Analysis: A⇒B⇒C**

This observation form is designed to record the student's target behavior as well as antecedent and consequent events. The target behavior must have an observable and measurable definition. This functional analysis will help determine what is causing or maintaining the behavior.

Student: _______________________  Date: _______________________

Class: ________________________  Time: _______________________

Target Behavior: __________________________________________

<table>
<thead>
<tr>
<th>Antecedents</th>
<th>Behavior</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
Systematic Functional Assessment Observation

<table>
<thead>
<tr>
<th>Student:</th>
<th>Building:</th>
<th>Grade:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>Time:</td>
<td>Location:</td>
</tr>
<tr>
<td>Activity:</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Teacher Behaviors</th>
<th>Peer Behaviors</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(I) = Ignore</td>
<td>(I) = Ignore</td>
<td>(LI) = Large-group Instruction</td>
</tr>
<tr>
<td>(VA) = Verbal Attention</td>
<td>(VA) = Verbal Attention</td>
<td>(SG) = Small-group Activity</td>
</tr>
<tr>
<td>(PA) = Physical Attention</td>
<td>(PA) = Physical Attention</td>
<td>(IS) = Independent Seatwork</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(T) = Transition</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Behaviors</th>
<th>(Operational Definition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ATT) = Attending</td>
<td></td>
</tr>
<tr>
<td>(AE) = Academic Engagement</td>
<td></td>
</tr>
<tr>
<td>(NC) = Noncompliance</td>
<td></td>
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<tr>
<td>(N) = Noisy</td>
<td></td>
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<tr>
<td>(IL) = Inappropriate Locale</td>
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<tr>
<td>(FN) = Physically Negative</td>
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<tr>
<td>(SI) = Social Interaction</td>
<td></td>
</tr>
<tr>
<td>(V) = Verbalization</td>
<td></td>
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<tr>
<td>(AR) = Academic Response</td>
<td></td>
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</tbody>
</table>

Type of Observation:
<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
<th>Between</th>
<th>Before</th>
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<tbody>
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</tbody>
</table>
### Functional Assessment Observation

**Student:**

**Building:**

**Grade:**

**Date:**

**Time:**

**Location:**

**Activity:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Antecedent</th>
<th>Behavior</th>
<th>Consequence</th>
<th>Possible Function*</th>
<th>Comments</th>
</tr>
</thead>
</table>

*Possible Functions: Obtain, Attention, Objects, Stimulation, Avoid/Escape, Attention, Pain, Difficult Tasks*
Academic Concerns?

**Curriculum-based Evaluation (CBE)—a functional evaluation using specific procedures and techniques to provide information for educational decision making**

Strategies of Functional Analysis

1. Functional assessment

2. Identify functions
   - *Obtain*
   - *Attention*
   - *Objects*
   - *Stimulation*
   - *Avoid/Escape*
   - *Attention*
   - *Pain*
   - *Difficult Tasks*

3. Identify replacement behavior
   * A behavior that is as efficient as problem behavior

4. Predict how the behavior would change given a specific intervention

5. Intervene—systematically manipulate or change the environmental contingencies
Example

Functional Analysis

<table>
<thead>
<tr>
<th>Activity</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algebra</td>
<td>///</td>
<td>///</td>
<td>///</td>
</tr>
<tr>
<td>Child Development</td>
<td>///</td>
<td>///</td>
<td>///</td>
</tr>
<tr>
<td>Biology</td>
<td>///</td>
<td>///</td>
<td>///</td>
</tr>
<tr>
<td>Geography</td>
<td>///</td>
<td>///</td>
<td>///</td>
</tr>
<tr>
<td>Speech</td>
<td>///</td>
<td>///</td>
<td>///</td>
</tr>
</tbody>
</table>

* Julie asked to leave because she was bleeding. She left and did not return until the end of the period.
Practice

Outline the procedures to be used to functionally analyze an assignment completion problem.

**Functional Analysis** (Summary of method (e.g., ABC, SORKC) and findings (e.g., antecedents, consequences, setting))
Goal Setting

Overview

Goal = the intended outcome of the intervention; the direction and extent to which the target behavior is to be changed

Performance standards options (also used for Problem Validation)

- Typical peer performance
  - Classroom norms
  - Peer comparison data

- Expert judgment
  - Teacher expectations
  - Instructional placement standards
  - School policy/standards
  - Criteria for next environment

- Norms
  - Local norms
  - Developmental norms

Format

In \(\text{(number)}\) weeks, when \(\text{(condition)}\) occurs, \(\text{(Target student)}\) will \(\text{(behavior)}\) to a \(\text{(criterion)}\).

*the behavior may be the target behavior or an incompatible behavior that is to replace the target behavior
Example

Goal [Specify time, condition, behavior, and criterion]

In 6 weeks, when given an assignment, Steve will turn in the completed assignment on the day it is due 95% of the time.

Practice

Write a goal for a math concern.

Goal [Specify time, condition, behavior, and criterion]
Overview

*Intervention Plan* = a written step-by-step plan describing the procedures relevant to solving the identified problem (i.e., who will do what, when they will do it, where the plan will be implemented, how the steps will be completed, with whom the plan will be implemented)

**Purpose**
- Common understanding of the plan
- Guide for implementors
- Record of the intervention
- Determining treatment integrity

*Stranger Test*—*the plan should be clear enough that a trained reader could replicate the intervention and produce the same results*

1. *Procedures for the intervention*
2. *Materials needed for the intervention*
3. *Who will implement the intervention*
4. *When will the intervention be implemented*
5. *Where will the intervention occur*
6. *Decision-making plan*
   - Frequency of data collection
   - What strategies will be used to summarize data for evaluation
   - How many data points or how much time should occur before data will be analyzed
   - *Decision rule*—*a statement describing the actions that will be taken based on the intervention data*
Example

**Intervention Plan**

**Intervention Selected:** [Specify procedures, materials, who, when, and where below]

Direct Instruction in subtraction using Silbert, Carnine, & Stein's D1 Mathematics (in addition to regular class instruction)

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Materials</th>
<th>Who</th>
<th>When</th>
<th>Where</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtraction with Lines</td>
<td>D1 Math</td>
<td>Ms. Aide</td>
<td>8:00-8:30</td>
<td>Homeroom</td>
</tr>
<tr>
<td>(pg. 169)</td>
<td></td>
<td></td>
<td>m Tu F</td>
<td></td>
</tr>
<tr>
<td>Teaching Regrouping</td>
<td>D1 Math</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(pg. 174)</td>
<td></td>
<td></td>
<td>(two days</td>
<td></td>
</tr>
<tr>
<td>Subtraction with</td>
<td>D1 Math</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renaming</td>
<td>(pg. 176)</td>
<td></td>
<td>for each</td>
<td></td>
</tr>
<tr>
<td>Test Numbers Minus 1</td>
<td>D1 Math</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FreeKills</td>
<td>(pg. 179)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renaming Numbers with Zeros</td>
<td>D1 Math</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(pg. 180)</td>
<td></td>
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</tr>
</tbody>
</table>

**Decision Making Plan** [Frequency of data collection, strategies to be used to summarize data for evaluation, number of data points or length of time before data analysis, decision rule]

Cory's level of performance will be measured twice a week by the classroom teacher using a grade-level subtraction sheet. The number of digits correct on each probe will be graphed after each collection. At the end of each week, Cory's performance will be evaluated. If Cory's performance falls below the goal line for three consecutive data points, a meeting will be held to consider changes in the intervention. If Cory's performance reaches or exceeds the goal, a meeting will be held to develop procedures for maintenance.
Practice

Design an intervention plan to increase a student's appropriate verbal responses in class.

<table>
<thead>
<tr>
<th>Intervention Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention Selected:</strong> [Specify procedures, materials, who, when, and where below]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Materials</th>
<th>Who</th>
<th>When</th>
<th>Where</th>
</tr>
</thead>
</table>

**Decision Making Plan** [Frequency of data collection, strategies to be used to summarize data for evaluation, number of data points or length of time before data analysis, decision rule]
Treatment Integrity

Overview

*Treatment Integrity* = the degree to which the intervention is implemented as planned

If the intervention is not implemented as designed, progress (or lack thereof) cannot be attributed to the specific intervention plan.

As a result, *resistance to intervention* cannot be determined.

Ways to measure treatment integrity
- Interview
- Direct observation
- Checklist
## Example

**Treatment Integrity** [Summary of treatment integrity observations or checklists]

- Week of 10/1 - 96% Mean Integrity
- Week of 10/9 - 100% Mean Integrity
- Week of 10/16 - 88% Mean Integrity
- Week of 10/23 -
- Week of 10/30 -

(See attached "Treatment Integrity Weekly Checklists")

### Treatment Integrity Weekly Checklist: Week of 10/16

<table>
<thead>
<tr>
<th>Components</th>
<th>M</th>
<th>T</th>
<th>W</th>
<th>T</th>
<th>F</th>
<th>% Component Integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teacher reminds student to participate in class at the start of class.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>80%</td>
</tr>
<tr>
<td>2. Teacher calls on student the first time the student raises his hand to respond to a teacher question.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>100%</td>
</tr>
<tr>
<td>3. After the first time, the teacher calls on the student every other time he raises his hand to respond to a teacher question.</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>80%</td>
</tr>
<tr>
<td>4. Teacher marks on an index card the number of times the student verbally responded to a teacher question.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>100%</td>
</tr>
<tr>
<td>5. Teacher reviews the data with the student at the end of class.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>80%</td>
</tr>
</tbody>
</table>

% Daily Integrity = 100% 80% 100% 80% 80% % Mean Integrity = 88%
Practice

Develop a procedure for measuring and summarizing the treatment integrity of an intervention for attending.

*Treatment Integrity [Summary of treatment integrity observations or checklists]*
Overview

*Progress Monitoring* = frequent and repeated measurement of the target behavior (e.g., one to three times per week) used in the decision-making process

Same procedure used for Baseline Data

General ways to gather data
- *Frequency count*
- *Percentage*
- *Time (duration or latency)*
- *Rating scales*
- *Checklists*
- *Observation procedures* (e.g., momentary time-sampling, partial-interval recording, whole-interval recording)
- *Permanent products*
- *Portfolios*
- *Rubrics*
- *Others*

Specific procedures
- *Curriculum-based Measurement (CBM)*
- *Goal-attainment Scaling (GAS)*
  — a five-point scale ranging from a +2 to a -2 and descriptions of the target behavior and problem situation that correspond to the following
conditions: Best Possible Behavior (+2), No Change in Behavior (0), and Worst Possible Behavior (-2)

Graphic display or visual representation

- Visual summary of student performance
- Impact inferences about effectiveness and progress
- Professional accountability

Standard format:

1. Title should provide a concise description of the nature and purpose of the intervention

2. Scale captions should establish the identity and meaning of the behavior and measurement procedure

3. X and Y scales and their scale units should represent the appropriate type and range of scales

4. Different intervention phases should be labeled on the graph

5. All relevant data should be shown in an appropriate form
Example

Progress Monitoring and Formative Evaluation

**Measurement Strategy** [Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]

The teacher will monitor Christy's attending behavior using a GAS procedure during the morning floor work (everyday). Once a week, the school psychologist will observe during the morning seatwork and also monitor Christy's attending behavior using a momentary-time sampling procedure that is then translated into the GAS measures to provide additional support to the teacher's ratings.

The following scale will be used:

-2 Christy looks at the teacher when spoken to (90%), listens to instructions, and almost always (90%) acts accordingly without additional prompts or cues.

-1 Christy frequently looks at the teacher when spoken to (60 to 80%), listens to their instructions, and often (60 to 80%) acts accordingly. Some prompts or cues are occasionally needed to get compliance.

0 Christy occasionally looks at the teacher when spoken to (40 to 60%), listens to their instructions, and only occasionally (40 to 60%) acts accordingly. Prompts and cues are usually needed to get this level of compliance.

-1 Christy infrequently looks at or listens to the teacher when spoken to (20 to 40%) and rarely (20 to 40%) acts accordingly. Strong physical prompts and verbal cues are needed to get minimal compliance.

-2 Christy virtually never looks at or listens to the teacher when spoken to (less than 20%) and almost always (less than 10%) fails to act accordingly. Strong and repeated physical prompts with loud verbal cues are needed to get compliance.

Graph or Chart

(See Attached Graph)
Practice

Choose a measurement strategy and create a graph for a writing fluency (i.e., rate and accuracy) concern.

<table>
<thead>
<tr>
<th>Progress Monitoring and Formative Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurement Strategy</strong> [Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graph or Chart</th>
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</thead>
</table>
Program Evaluation

Overview

Program Evaluation = Formative Evaluation + Summative Evaluation

Formative Evaluation = occurs throughout the implementation of the intervention.

Purpose: to determine the likely success of an intervention during its implementation so that it can be modified or changed to increase the likelihood that intended results will be achieved.

Summative Evaluation = occurs after an intervention has been completed.

Purpose: to determine whether the intervention was successful and produced positive student outcomes.

Advantages

1. The more precise and thorough we are in our evaluation procedures, the more information we will obtain about students.

2. By evaluating interventions across target behaviors, students, teachers, parents, and setting, a wide repertoire of potentially useful interventions will be identified.

3. Ongoing monitoring of students' performance during the delivery of an intervention allows one to identify specific procedural difficulties and to make necessary modifications to intervention components, thereby increasing the effectiveness of the intervention package.
Formative Evaluation

Visual analysis of data

Mean— *Is the average rate of performance higher (or lower) during the intervention than during baseline?*

Level— *Is there a discontinuity of performance (in the desired direction) from the end of baseline to the start of the intervention?*

Trend— *Does the trend in performance increase (or decrease) over time?*

- Trend line procedures
  1 Split middle
  2 Tukey's

Latency— *Is there a change in performance (in the desired direction) after the first week of intervention implementation?*

Refer back to decision-making plan

Summative Evaluation

Refer back to decision-making plan

Compare baseline performance to post-intervention performance
Example

Progress Monitoring and Formative Evaluation

Measurement Strategy [Who’s responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]

As part of the class-wide progress monitoring plan for language arts, Eric’s teacher will administer a 3-minute writing probe using CBM procedures every Tuesday and Thursday. Both Total Words Written and Words Spelled Correctly will be graphed.

Graph or Chart

(See Attached Graph)

Summative Evaluation

Behavior Discrepancy AFTER Intervention

- What is the student’s current level of performance?  
  40 TWJ 17 WSC (A)
- What level of student performance would be acceptable?  
  54 TWJ 61 WSC (B)
- What is the discrepancy between the level of A and B?  
  14 TWJ (= errors) (C)
- What standard is used to determine the acceptable level of performance in Item B: peer performance

Standards:  
- Local norms  
- Peer performance  
- Criteria for the next environment  
- Instructional placement standards  
- Developmental standards  
- Teacher expectation  
- School policy/standards  
- Medical  
- Other – please specify

Outcome Data

Check one:

- [ ] Problem resolved
- [X] Progress being made, continuing with plan
- [ ] Problem not resolved, redesigning or modifying the intervention
- [ ] Problem not resolved, determining entitlement for special education
**Practice**

Write a program evaluation plan for a "tantruming" problem. Include both formative and summative evaluation strategies.

### Progress Monitoring and Formative Evaluation

**Measurement Strategy** [Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]

| Graph or Chart |
|----------------|----------------|
|               |               |
|               |               |
|               |               |
|               |               |

### Summative Evaluation

**Behavior Discrepancy AFTER Intervention**

- What is the student's current level of performance? \( A \)
- What level of student performance would be acceptable? \( B \)
- What is the discrepancy between the level of \( A \) and \( B \)? \( C \)

**Outcome Data**

Check one:

- Problem resolved
- Progress being made, continuing with plan
- Problem not resolved, redesigning or modifying the intervention
- Problem not resolved, determining entitlement for special education
Case Study: Academic Concern

Intervention Documentation

Student's Name: Chris  Grade: 1st  B.D.: 

Teacher(s): Carmen and Jan  District/Building: Elementary

Parent(s): Chris's Mom  Phone: (H) (615) 666-1114  (W) (615) 666-9876

Case Coordinator: School Psychologist

Definition of Behavior

Behavior is defined as the student's inability to read at a grade level equivalent to their grade. Examples include:

- Behavior is too loud or too soft
- Behavior is too fast or too slow
- Behavior is too much or too little
- Behavior does not happen correctly
- Behavior takes too long to begin after a prompt
- Behavior occurs but is inappropriate or inefficient
- Behavior is too loud, forceful, or too soft, passive etc.

Baseline Data and Problem Validation

Dimension of Behavior

- Behavior happens too much or too little (Frequency)
- Behavior takes too long to begin after a prompt (Lateness)
- Behavior occurs but is inappropriate or inefficient (Topography)
- Behavior is too loud, forceful, or too soft, passive etc. (Intensity)

Behavior Discrepancy BEFORE Intervention

- What is the student's current level of performance, the baseline? 15 WRC with 65% accuracy (A)
- What level of student performance would be acceptable? 30 WRC with 95% accuracy (B)
- What is the discrepancy between the level of A and B? 15 WRC and 30% accuracy (C)
- What standard is used to determine the acceptable level of performance in Item B: Instructional Placement

Standards:

- Local norms
- Peer performance
- Criteria for the next environment
- Instructional placement standards
- Developmental standards
- Teacher expectation
- School policy/standards
- Medical
- Other—please specify

Functional Analysis

Curriculum-based Evaluation (CBE) reading procedures indicated:

- Chris can read pre-primer material (level 1) quickly (31 WRC) but not accurately (82% accuracy)
- All other material is not fluent (rate and speed) read
- An error analysis indicates almost 76% of Chris' errors are sight words - most of which he should know by the end of 1st grade
- A phonics evaluation found that Chris knows his consonant sounds, but does not know his vowel sounds. (See the CBE report by school psychologist for more details)
Goal [Specify time, condition, behavior, and criterion]

In 10 weeks, given Dolch-word reading passages, Chris will read 10 words correctly per minute with 95% accuracy (0 to 1 errors).

Intervention Plan

Intervention Selected: [Specify procedures, materials, who, when, and where below]

(1) One-on-One Chapter 1 reading services, (2) Regular classroom accommodations (i.e., reteaching, drill & practice, peer tutoring), (3) Weekly practice/evaluation of phonics skills and practice on timed readings

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Materials</th>
<th>Who</th>
<th>When</th>
<th>Where</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1 one-to-one</td>
<td>SBA Materials</td>
<td>Jan</td>
<td>m - F</td>
<td>Chapter</td>
</tr>
<tr>
<td>1 Room</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>- phonics instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- drill of classroom words</td>
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<td>Classroom accommodations</td>
<td>SBA Materials</td>
<td>Carmen</td>
<td>Daily</td>
<td>Classroom</td>
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<tr>
<td>- reteaching of daily skill</td>
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<td></td>
</tr>
<tr>
<td>- drill and practice of daily words</td>
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<td></td>
</tr>
<tr>
<td>- peer tutoring during large-group work</td>
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</tr>
<tr>
<td>Practice of phonics skills and</td>
<td>MASI Phonics</td>
<td>School Psych</td>
<td>Mondays</td>
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<tr>
<td>timed readings</td>
<td></td>
<td></td>
<td>Elementary</td>
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<td>Materials</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Dach-word Probes</td>
<td></td>
</tr>
</tbody>
</table>

Decision Making Plan [Frequency of data collection, strategies to be used to summarize data for evaluation, number of data points or length of time before data analysis, decision rule]

The school psychologist will progress monitor reading fluency using Dach-word reading materials - 3 passages weekly, graphing the median score. If three consecutive data points fall below the goal line, a meeting will be held with the parents, teachers, and AEA team to determine the next step (i.e., continue with intervention, modify intervention, or evaluate for additional services).
Treatment Integrity [Summary of treatment integrity observations or checklists]


| Week of 1/10 | 89%   |
| Week of 1/17 | 87%   |
| Week of 2/27 | 93%   |
| Week of 4/3  | 76%   |
| Week of 3/18 | 98%   |
| Week of 4/17 | Student ill all week |
| Week of 3/20 | 90%   |
| Week of 4/24 | 98%   |

Progress Monitoring and Formative Evaluation

Measurement Strategy [Who’s responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]

School psychologist will collect data one time weekly using 3 reading passages from Dolch-word reading passages. Curriculum-based Measurement (CBM) reading administration and scoring procedures will be used. The median passage will be graphed.

Graph or Chart
(See attached graph)

Summative Evaluation

Behavior Discrepancy AFTER Intervention
- What is the student’s current level of performance? 23 WRC with 65% accuracy (A)
- What level of student performance would be acceptable? 30 WRC with 95% accuracy (B)
- What is the discrepancy between the level of A and B? -7 WRC with -27% accuracy (C)
- What standard is used to determine the acceptable level of performance in Item B: Instructional Placement

Standards:
• Local norms • Peer performance • Criteria for the next environment • Instructional placement standards
• Developmental standards • Teacher expectation • School policy/standards • Medical • Other—please specify

Outcome Data
Check one: [ ] Problem resolved
[ ] Progress being made, continuing with plan
[ ] Problem not resolved, redesigning or modifying the intervention
[ ] Problem not resolved, determining entitlement for special education
How could the quality of the academic case study be improved?

1) *Functional Analysis*—further analysis of problem (i.e., teacher interview, record review) and plan of action to manipulate contingencies.

2) *Intervention Plan*—more specific description of procedures; no note of following decision-making plan when data points fell below the goal line.

3) *Treatment Integrity*—unclear of what the percentages actually represent.
Case Study: Non-Academic Concern

Intervention Documentation

Student's Name: A. J. Thimes  Grade: Kindergarten  B.D.: 

Teacher(s): Ms. Stein  District/Building: Oxford 

Parent(s): Mrs. Thimes  Phone: (H) (999) 666-1234  (W) (999) 666-9876 

Case Coordinator: School Social Worker

Definition of Behavior [Behavior is defined then three examples and three nonexamples are provided]

Tantruming means A.J. cries audibly after an adult answers "no" to one of his requests or after an adult gives him a direct command to do something. Examples include (a) crying when told to put away materials when it is time for lunch; (b) crying and tearing up papers when he is told by an adult to group his toys by color; and (c) crying and throwing a toy after being told "no" when A.J. asks if he may play with the toy. Nonexamples include (a) crying after falling down at recess; (b) crying out loudly during outside activities; and (c) crying after someone said something that hurt his feelings.

Baseline Data and Problem Validation

Dimension of Behavior [What about the behavior is problematic?]

- Behavior happens too much or too little (Frequency)
- Behavior happens too long or too short (Duration)
- Behavior doesn't happen correctly (Accuracy)
- Behavior takes too long to begin after a prompt (Latency)
- Behavior occurs but is inappropriate or inefficient (Topography)
- Behavior is too loud, forceful, or too soft, passive etc. (Intensity)

Behavior Discrepancy BEFORE Intervention

- What is the student's current level of performance, the baseline? 40 minutes (A)
- What level of student performance would be acceptable? < 10 minutes (B)
- What is the discrepancy between the level of A and B? 30 minutes (C)
- What standard is used to determine the acceptable level of performance in Item B: teacher exp. & peer perf.

Standards:
- Local norms
- Peer performance
- Criteria for the next environment
- Instructional placement standards
- Developmental standards
- Teacher expectations
- School policy/standards
- Medical
- Other—please specify

Functional Analysis [Summary of method (e.g., ABC, SORKC) and findings (e.g., antecedents, consequences, setting)]

Procedures: SORKC model analysis of observation in math (most problematic) and art (least problematic), applied behavior analysis principles, professional experience

Hypothesis: A.J.'s tantruming is being reinforced by the teacher's attention and by tantruming A.J. escapes from a task that may be aversive to him. In addition, it appears the Ms. Stein often is being reinforced for paying attention to A.J.'s inappropriate behavior (his crying appears to become less loud when she talks to him), thus making her more likely to attend to him when he cries.
**Plan of Action:** Ms. Stein will attend to A.J.'s working during math, ignore his tantruming, directly
instruct him in how to complete the math assignment, modify A.J.'s math assignments so that he could
complete the majority of them during group work without assistance, and provide stickers and behavior-
specific praise (attention) frequently throughout the day contingent on his appropriate behavior.

**Goal** [Specify time, condition, behavior, and criterion]

In 6 weeks, when he is at school, A.J. will tantrum for less than ten minutes per day for 8 out of 10
consecutive school days.

**Intervention Plan**

**Intervention Selected:** [Specify procedures, materials, who, when, and where below]

attending to appropriate behavior, ignoring tantruming, instruction in math, modifications in
math

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Materials</th>
<th>Who</th>
<th>When</th>
<th>Where</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher attention for</td>
<td>—</td>
<td>Ms. Stein</td>
<td>Daily</td>
<td>Classroom</td>
</tr>
<tr>
<td>appropriate working</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher-led instruction on new</td>
<td>Holt Math</td>
<td>Ms. Stein</td>
<td>&quot;&quot;</td>
<td>&quot;&quot;</td>
</tr>
<tr>
<td>materials/directions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modifications in math</td>
<td>Holt Math</td>
<td>Ms. Stein</td>
<td>&quot;&quot;</td>
<td>&quot;&quot;</td>
</tr>
<tr>
<td>assignments (e.g., shortened)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Contingent teacher ignoring of</td>
<td>—</td>
<td>Ms. Stein</td>
<td>&quot;&quot;</td>
<td>&quot;&quot;</td>
</tr>
<tr>
<td>tantrums</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Behavior-specific praise</td>
<td>—</td>
<td>Ms. Stein</td>
<td>&quot;&quot;</td>
<td>&quot;&quot;</td>
</tr>
<tr>
<td>contingent on appropriate behavior</td>
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</tbody>
</table>

**Decision Making Plan** [Frequency of data collection, strategies to be used to summarize data for evaluation,
number of data points or length of time before data analysis, decision rule]

A.J.'s level of performance will be summarized during each week by determining the median
performance for the week. It is expected there will be an abrupt increase in A.J.'s tantruming
then a rapid decrease (within the first 2 weeks) down to below 10 minutes per day. A.J.'s
performance will be evaluated at the end of each week, and if his performance does not match
the predicted pattern, further analyses will be conducted and the intervention changed.
Treatment Integrity [Summary of treatment integrity observations or checklists]

Procedure: School psychologist interviewed teachers prior to the implementation of the intervention, after the first week of implementation to make sure everything is going as planned. Phone call after the following week. Asked the principal to stop by periodically to see how the program is working.

Progress Monitoring and Formative Evaluation

Measurement Strategy [Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]

Ms. Stein will collect observational data two times per week for the complete school day. The duration of A.J.'s tantrums will be measured using a stopwatch (Ms. Stein will carry a stopwatch in her pocket and turn it on when A.J. tantrumed and off when he stopped).

Graph or Chart
(See attached graph)

Summative Evaluation

Behavior Discrepancy AFTER Intervention
- What is the student's current level of performance? 8 minutes (A)
- What level of student performance would be acceptable? < 10 minutes (B)
- What is the discrepancy between the level of A and B? + 2 minutes (C)
- What standard is used to determine the acceptable level of performance in Item B: Teacher Exp. & Peer

Standards:
- Local norms
- Peer performance
- Criteria for the next environment
- Instructional placement standards
- Developmental standards
- Teacher expectations
- School policy/standards
- Medical
- Other—please specify

Outcome Data
Check one:
- Problem resolved
- Progress being made, continuing with plan
- Problem not resolved, redesigning or modifying the intervention
- Problem not resolved, determining entitlement for special education

How could the quality of the non-academic case study be improved?

1) Intervention Plan—more detail of what the procedures were.

2) Treatment Integrity—need more information as to what components of the intervention were carried out.
References


Iowa Department of Education (1994). *Student improvement is job #1: Monitoring student progress*. Des Moines, IA: Author.


APPENDIX I. FOLLOW-UP TRAINING MATERIALS
Follow-up: Designing and Implementing Interventions

Intervention Study Training for Extended Problem-Solving (Level III)

Kristi R. Flugum
Heartland Area Education Agency 11

1996
Agenda

Overview

Review of Components of an Intervention
  Overview
  Format
  Questions/Practice

Case Examples
  Academic
  Non-academic

Additional Practice and Questions

Directions for this Phase
  Distribution of Materials
= a planned modification of the environment made for the purpose of altering behavior in a pre-specified way

3 components

1) **Planful**—the procedures to be applied are specified clearly and completely

2) **Environmentally Focused**—the actions taken modify the environment, not the individual

3) **Goal Directed**—the behavior is altered in a pre-specified way
Behavior Definition

= a description of the behavior of concern or target behavior in specific, objective, and measurable terms

- objective — referring only to observable characteristics of the behavior or environmental events, translating any inferential terms into more objective ones

- clear — being readable and so unambiguous that it could be read, repeated, and paraphrased by observers

- complete — delineating both examples and non-examples of the behavior so that differences between occurrences and non-occurrences of the behavior can be discerned

Format

(Target behavior) means that (Target student) (Action verbs).
Examples of (Target behavior) include (1) __________, (2) __________, (3) __________. Non-examples of (Target behavior) include (1) __________, (2) __________, (3) __________.

Questions/Practice
repeated measurement of the target behavior prior to implementing the intervention to determine the student's current level of performance

3 steps

1) identify the appropriate dimension using the acronym FLITAD
   Frequency
   Latency
   Intensity
   Topography
   Accuracy
   Duration

2) develop a measurement strategy by answering the following questions:
   How will the data be collected?
   What materials will be used to collect data?
   In which setting(s) will data be collected?
   Who will be responsible for collecting the data?
   When (and how often) will the data be collected?

3) collect the data prior to implementing the intervention

Questions/Practice
problem = the difference between what is expected and what actually occurs

performance standards options
• typical peer performance:
• expert judgment:
• norms:

2 questions
1) Is there a discrepancy between the target student's performance and the performance standard?

2) If a discrepancy exists, is it large enough to warrant intervention?

Questions/Practice
Functional Assessment = a scientific method designed to discover the functional relation between the problem behavior and the variables that influence or control it

Functional Assessment = gathering information

Strategies of Functional Analysis

1) Functional assessment

2) Identify functions

3) Identify replacement behavior—one that is as efficient as the problem behavior

4) Predict how the behavior would change given a specific intervention

5) Intervene—systematically manipulate or change the environmental contingencies

Questions/Practice
= the intended outcome of the intervention; the direction and extent to which the target behavior is to be changed

Performance standards options (also used for Problem Validation)

Format

In (number) weeks, when (condition) occurs, (Target student) will (behavior*) to a (criterion).

Questions/Practice
= a written step-by-step plan describing the procedures relevant to solving the identified problem

Purpose
• common understanding of the plan
• guide for implementors
• record of the intervention
• determine treatment integrity

Stranger Test

1) procedures for the intervention
2) materials needed for the intervention
3) who will implement the intervention
4) when will the intervention be implemented
5) where will the intervention occur
6) decision-making plan
   • frequency of data collection
   • what strategies will be used to summarize data for evaluation
   • how many data points or how much time should occur before data will be analyzed
   • decision rule—a statement describing the actions that will be taken based on the intervention data

Questions/Practice
Treatment Integrity

= the degree to which the intervention is implemented as planned

resistance to intervention

ways to measure treatment integrity
• interview
• direct observation
• checklist

Questions/Practice
frequent and repeated measurement of the target behavior (e.g., one to three times per week)

- used in the decision-making process

general ways to gather data
- frequency count
- percentage
- time (duration and latency)
- rating scales
- checklists
- observation procedures
- permanent products
- portfolios
- rubrics

Benefits of a graphic display or visual representation
- visual summary of student performance
- impact inferences about effectiveness and progress
- professional accountability

Standard format for graphs
- Title should provide a concise description of the nature and purpose of the intervention
- Scale captions should establish the identity and meaning of the behavior and measurement procedure
- X and Y scales and their scale units should represent the appropriate type and range of scales
- Different intervention phases should be labeled on the graph
- All relevant data should be shown in an appropriate form

Questions/Practice
= Formative Evaluation + Summative Evaluation

Formative Evaluation = occurs throughout the implementation of the intervention

Summative Evaluation = occurs after the intervention has been completed

Visual analysis of data

- Mean - Is the average rate of performance higher (or lower) during the intervention than during baseline?
- Level - Is there a discontinuity of performance (in the desired direction) from the end of baseline to the start of the intervention?
- Trend - Does the trend in performance increase (or decrease) over time?
- Latency - Is there a change in performance (in the desired direction) after the first week of intervention implementation?

- Refer back to decision-making plan

Questions/Practice
Intervention Documentation

Student's Name: J. N.        Grade: 2nd        B.D.: 
Teacher(s): Mrs. M        District/Building: Elementary
Parent(s): J. N. Parents        Phone: (H) (W) 
Case Coordinator: School Psychologist

Definition of Behavior [Behavior is defined then three examples and three nonexamples are provided]

Reading Fluency means J.N. will read grade level material quickly and accurately. Examples include: (a) reading 2nd grade material at a rate of 70 words read correctly per minute; and (b) reading 2nd grade material with 95% accuracy. Nonexamples include: (a) reading 2nd grade material at a rate of less than 70 words read correctly per minute; and (b) reading 2nd grade material with less than 95% accuracy.

Baseline Data and Problem Validation

Dimension of Behavior [What about the behavior is problematic?] Frequency and Accuracy

- Behavior happens too much or too little (Frequency)
- Behavior happens too long or too short (Duration)
- Behavior doesn't happen correctly (Accuracy)
- Behavior takes too long to begin after a prompt (Latency)
- Behavior occurs but is inappropriate or inefficient (Topography)
- Behavior is too loud, forceful, or too soft, passive etc. (Intensity)

Behavior Discrepancy BEFORE Intervention

- What is the student's current level of performance, the baseline? 34 WRC (A)
- What level of student performance would be acceptable? 70 WRC, 95% accuracy (B)
- What is the discrepancy between the level of A and B? 2.06 times discrepant (C)
- What standard is used to determine the acceptable level of performance in Item B: Instructional Placement

Standards: Local norms, Peer performance, Criteria for the next environment, Instructional placement standards
Developmental standards, Teacher expectation, School policy/standards, Medical, Other—please specify

Functional Analysis [Summary of method (e.g., ABC, SORKC) and findings (e.g., antecedents, consequences, setting)]

Educational History: J. N. has attended First Community before enrolling at Elementary in 2nd grade.

Curriculum-based Evaluation (CBE) procedures: see attached report

Goal [Specify time, condition, behavior, and criterion]

In ten weeks, when given the 2nd grade material, J.N. will read 70 words correctly per minute with 95% accuracy.
**Intervention Plan**

**Intervention Selected:** [Specify procedures, materials, who, when, and where below]

Small-group reading instruction in 1st grade material, Title I reading services, Big Buddy, and Parent packets

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Materials</th>
<th>Who</th>
<th>When</th>
<th>Where</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small-group reading instruction (3 to 1) in 1st Grade Classroom</td>
<td>1st Grade Houghton-Mifflin Reading material, Title 1 reading services, Big Duddy, and Parent packets</td>
<td>Mrs. M</td>
<td>Daily</td>
<td>Classroom</td>
</tr>
<tr>
<td>1st grade material (phonics work - short vowels, blends)</td>
<td>— 15 minutes of reading instruction directly with teacher 3 of 4 days, the other day she does seatwork at her instructional level and independent reading</td>
<td>— 30 minutes of seatwork and independent reading at her instructional level (1st grade)</td>
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<td></td>
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</tbody>
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**Title I Reading:**

<table>
<thead>
<tr>
<th>Who</th>
<th>When</th>
<th>Where</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs. J</td>
<td>Daily</td>
<td>Title I</td>
</tr>
</tbody>
</table>

**Big Buddy**

<table>
<thead>
<tr>
<th>Instructional</th>
<th>HS Student</th>
<th>2 days</th>
<th>Elem</th>
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<tbody>
<tr>
<td>— 15 minutes of reading and 15 minutes of writing</td>
<td>(M &amp; F)</td>
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</table>

**Parent packets**

<table>
<thead>
<tr>
<th>Instructional</th>
<th>Mrs. M &amp; Parent</th>
<th>Weekly</th>
<th>Home</th>
</tr>
</thead>
</table>

**Decision Making Plan** [Frequency of data collection, strategies to be used to summarize data for evaluation, number of data points or length of time before data analysis, decision rule]

Mrs. M will monitor progress through CBM reading fluency procedures—at least one 1-minute timed reading a week using Houghton-Mifflin 2nd grade passages.

The data will be graphed and evaluated every other week by school psychologist. If three data points fall below the intended goal line, a meeting will be scheduled to consider changes in the intervention plan.

**Treatment Integrity** [Summary of treatment integrity observations or checklists]

Teacher report: occurring on a daily basis (or on the days originally intended to occur)
Progress Monitoring and Formative Evaluation

Measurement Strategy [Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]

Mrs. M (or the school psychologist) will administer at least one CBM reading probe per week and graph the data.

Graph or Chart

(See attached graph.)

Summative Evaluation

Behavior Discrepancy AFTER Intervention

- What is the student's current level of performance? 39 WRC, 76% accuracy (A)
- What level of student performance would be acceptable? 70 WRC, 90% accuracy (B)
- What is the discrepancy between the level of A and B? 179 times discrepant (C)
- What standard is used to determine the acceptable level of performance in Item B: Instructional Placement

Standards & Local Norms

Standards: Local norms, Peer performance, Criteria for the next environment, Instructional placement standards

Outcome Data

Check one: Problem resolved
Progress being made, continuing with plan
Problem not resolved, redesigning or modifying the intervention
Problem not resolved, determining entitlement for special education

How could the quality of the academic case study be improved?
Intervention Documentation

Student's Name: Daryl
Grade: 2nd
B.D.: ____________________________

Teacher(s): Mrs. K
District/Building: Elementary

Parent(s): Daryl's parents
Phone: (H) ______________________ (W) ______________________

Case Coordinator: School Psychologist

Definition of Behavior [Behavior is defined then three examples and three nonexamples are provided]

Inappropriate behavior means Daryl is noncompliant (i.e., does not follow a direction given by a teacher or follow a school rule) or is physically aggressive towards other students. Examples include (a) Daryl is asked to line up after recess and he continues to walk around the playground; (b) Daryl is told to keep his hands to himself as the class walks down the hall, but Daryl hits another student; and (c) Daryl is asked to apologize to a student for tripping her, but he does not. Nonexamples include (a) Daryl does not follow a school rule that he was not taught; (b) Daryl is asked to be quiet, but he raises his hand, is called on and asks a question related to the class activity.

Baseline Data and Problem Validation

Dimension of Behavior [What about the behavior is problematic?]  Frequency

- Behavior happens too much or too little (Frequency)
- Behavior happens too long or too short (Duration)
- Behavior doesn't happen correctly (Accuracy)
- Behavior takes too long to begin after a prompt (Latency)
- Behavior occurs but is inappropriate or inefficient (Topography)
- Behavior is too loud, forceful, or too soft, passive etc. (Intensity)

Behavior Discrepancy BEFORE Intervention

- What is the student's current level of performance, the baseline? 4 of 7 activities a day (approximately)
- What level of student performance would be acceptable? 7 of 7 activities per day (B)
- What is the discrepancy between the level of A and B? 3 activities (C)

Functional Analysis [Summary of method (e.g., ABC, SORKC) and findings (e.g., antecedents, consequences, setting)]

(see attached report)

Student Report: Last year (in 1st grade), Daryl frequently reported being picked on by other students. This year (in 2nd grade), he has stated that he is not going to be "bullied" anymore.
Goal [Specify time, condition, behavior, and criterion]

In ten weeks, in the school setting (including bus and recess), Daryl will demonstrate appropriate school behavior 7 of the 7 activities a day for two consecutive weeks.

Intervention Plan

Intervention Selected: [Specify procedures, materials, who, when, and where below]

Daily rating of 7 school activities by teacher(s) that is sent home for rewards/consequences at home.

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Materials</th>
<th>Who</th>
<th>When</th>
<th>Where</th>
</tr>
</thead>
<tbody>
<tr>
<td>• smiley-face or frown-face for each activity period</td>
<td>(see attached)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rewards/Consequences at home (money) Parents Daily Home

• very good day = a quarter
• okay day = a nickel
• bad day = no Saturday morning cartoons
• very bad day = in his room all evening

Decision Making Plan [Frequency of data collection, strategies to be used to summarize data for evaluation, number of data points or length of time before data analysis, decision rule]

Mrs. K will send a daily sheet home that rates Daryl's behavior in the 7 school activities. Mom will determine (with Daryl) whether it was a very good day, an okay day, a bad day, or a really bad day—rewards or consequences will then be implemented.

School psychologist will periodically (at least every other week) chart the number of periods out of 7 activities that Daryl received a smiley-face. If Daryl receives 4 or fewer smiley-faces for a five consecutive days, a meeting will be held to determine changes in the intervention program. If Daryl meets his goal, a meeting will be held to determine maintenance procedures for the plan.
Treatment Integrity [Summary of treatment integrity observations or checklists]

Interviews with guidance counselor, teacher, or mom by school psychologist
11/2 - did not start 10/31, started 11/1; teacher gone today
11/6 - teacher reports plan is going well
11/14 - questions regarding consistency of plan
11/27 - parents report note coming home more regularly
12/1 - note coming home consistently

(also see the chart to determine when a daily rating sheet was filled out)

Progress Monitoring and Formative Evaluation

Measurement Strategy [Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule – frequency of data collection per week]

Mrs. K will complete the daily scale on Daryl's behavior during 7 activity periods. School psychologist will chart the number of smiley faces Daryl received each day (this will be done at least every other week).

Graph or Chart

(see attached graph)

Summative Evaluation

Behavior Discrepancy AFTER Intervention

- What is the student's current level of performance? (A)
- What level of student performance would be acceptable? 7 of 7 activities a day (for 2 consecutive weeks) (C)
- What is the discrepancy between the level of A and B? _______

- What standard is used to determine the acceptable level of performance in Item B: Teacher Expectations

Standards: • Local norms • Peer performance • Criteria for the next environment • Instructional placement standards
• Developmental standards • Teacher expectation • School policy/standards • Medical • Other-please specify

Outcome Data

Check one:

- Problem resolved
- Progress being made, continuing with plan
- Problem not resolved, redesigning or modifying the intervention
- Problem not resolved, determining entitlement for special education

How could the quality of the non-academic case study be improved?
APPENDIX J. SCRIPT FOR DESCRIPTION OF STUDY TO PARTICIPANTS: HANDOUT
Problem-Solving Intervention Study

Assignments and Time Frame

The zone you work in determines the order of phases and time of year you will participate. Zones were drawn from a hat to determine what order that would be. The assignments are detailed below. As you can see, each phase is approximately nine weeks.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Time Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western (plus Adel)</td>
<td>Baseline</td>
</tr>
<tr>
<td>Southeastern</td>
<td>Baseline</td>
</tr>
<tr>
<td>Southwestern (minus Adel)</td>
<td>Baseline</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zone</th>
<th>Time Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone</td>
<td>Baseline</td>
</tr>
<tr>
<td>Middle</td>
<td>Baseline</td>
</tr>
<tr>
<td>Northeastern</td>
<td>Baseline</td>
</tr>
<tr>
<td>Northern</td>
<td>Baseline</td>
</tr>
</tbody>
</table>

General Requirements and Procedures for Each Phase

You will each be asked to submit a total of three problem-solving cases (one for each phase). A week prior to and a week after the completion of each phase, you will receive reminder letters to submit you documentation. You will also receive written directions for each phase prior to the start of that stage.

Baseline Phase   During the first nine week phase, you will turn in all intervention documentation for one "completed" problem-solving case in which you actively contributed to the design and/or implementation of the intervention.
A "completed" case refers to

(a) any intervention that began and finished during the time frame for that session; or
(b) any intervention that began during the time frame for that session and has been
implemented a minimum of three weeks—all intervention documentation gathered
up to the last day of that session will be considered part of that case.

The intervention documentation materials may be any of the agency's forms provided in
the program manual or any other method of documentation meeting the agency's criteria. At
the end of this session, you will be asked to complete three demographic questions (i.e.,
gender, years experience, and highest degree held) and a single question as to the outcome of
the intervention (i.e., problem resolved; progress being made, continuing with plan; problem
not resolved, redesigning or modifying the intervention; or problem not resolved,
determining entitlement for special education).

2nd Phase and 3rd Phase   Some of you may repeat the Baseline Phase procedure
for the second or third phase.

Protocol Phase   Others may be asked to use a particular intervention documentation
form for the next problem-solving case to be submitted. The requirements for a case are the
same as previously described with the exception that you will use the Intervention
Documentation Protocol provided. Not all of you will participate in this phase.

Training Phase   For either the second or third case, all of you will participate in a
one-day training on designing and implementing interventions at the beginning of the phase.
You will then be asked to use a particular intervention documentation form for that problem-
solving case to be submitted. Once again, the requirement for the case are the same as
previously described.

The dates and times for the training are:

<table>
<thead>
<tr>
<th>Region</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western (+ Adel)</td>
<td>Thursday, October 26, 1995</td>
<td>8:30-4:00</td>
</tr>
<tr>
<td>Southeastern</td>
<td>Thursday, January 4, 1996</td>
<td>8:30-4:00</td>
</tr>
<tr>
<td>Southwestern (- Adel)</td>
<td>Thursday, January 4, 1996</td>
<td>8:30-4:00</td>
</tr>
<tr>
<td>Middle</td>
<td>Thursday, January 18, 1996</td>
<td>8:30-4:00</td>
</tr>
<tr>
<td>Northeastern</td>
<td>Thursday, March 21, 1996</td>
<td>8:30-4:00</td>
</tr>
<tr>
<td>Northern</td>
<td>Thursday, March 21, 1996</td>
<td>8:30-4:00</td>
</tr>
</tbody>
</table>

The training will occur at your zone office or somewhere within your zone area. You
will be notified of the exact location prior to the training.
Confidentiality and Notification

To ensure confidentiality for yourself, the student, parents, and school staff the following steps will be taken. First, prior to submitting your materials you will be asked to black out all potentially identifying information such as full names of the student, teachers, parents, and yourself. The only demographic information needed will be the student’s grade and gender. The only specific information needed from yourselves will be the number of years of experience, your gender, and the highest degree you currently hold which will be gathered during the Baseline Phase.

It is assumed that teachers, parents, and students will be notified of the problem-solving intervention. School staff will have requested the assistance, therefore, they will be aware of the intervention(s), if not directly involved in the intervention. Parents will have been notified of the concerns regarding their child and informed, or better yet, be a part of designing and implementing the intervention(s). The student will have been told of the concern and reason for the intervention. If for some reason parents and student have not been notified of the concern and the proposed intervention(s) at the time of your involvement, it is strongly advised that the appropriate parties be notified at that time.

This information will in no way be used to evaluate you as a practitioner—it will be used only to provide information on problem-solving interventions.

Submitting Materials and Coding

All intervention documentation materials should be sent to Lorna Volmer or Marty Ikeda at the Johnston Office. The directions will include information as to how the materials should be coded. A letter code will be assigned to each phase and each zone. In addition, each practitioner will be assigned a numerical code.
APPENDIX K. DIRECTIONS FOR BASELINE PHASE PARTICIPANTS
To: School Psychologists, Special Education Consultants, and School Social Workers in
(_____ ) Zones

From: Lorna Volmer, Marty Ikeda, and Kristi Flugum

Re: Directions for First Phase of Intervention Study

Date: [8/25/95 or 11/9/95]

You are about to begin the first phase of the Intervention Study as of Monday, [8/28/95 or
11/13/95]. This phase requires you to complete one problem-solving case and submit all
intervention documentation materials. You may use any of the agency's intervention
documentation forms provided in the Program Manual or any other method of documentation
meeting the agency's criteria. Recall the requirements for this case:

1. The case must be one in which you have been actively involved in designing and/or
   implementing the intervention. AND

2. The intervention began and finished between the time frame of [8/28/95 and 10/27/95
   or 11/13/95 and 1/19/96]; OR

3. The intervention began during the time frame of [8/28/95 and 10/27/95 or 11/13/95
   and 1/19/96] and has been implemented a minimum of three weeks (submit all
   intervention documentation gathered up to [10/27/95 or 1/19/96]).

At the end of this phase ([10/27/95 or 1/19/96]), return all intervention documentation
materials to Lorna Volmer and Marty Ikeda in the Johnston Office. When you do so,
remember to do the following:

1. Black out all potentially identifying information such as full names of the student,
teachers, and parents.

2. Double check that you have the correct codes and information in the top right corner
   of the first page of the intervention documentation materials—a "B", your zone
   name, and practitioner code.

3. Also check that the student's grade and gender is identified on the documentation
   materials.

4. Complete the question regarding the outcome the intervention.

If you have any questions please contact Lorna Volmer or Marty Ikeda in the Johnston
Office.
APPENDIX L. REMINDER LETTER TO PARTICIPANTS
To: School Psychologists, Special Education Consultants, and School Social Workers in

(_____) Zones

From: Lorna Volmer, Marty Ikeda, and Kristi Flugum

Re: Ending of Phase for Intervention Study

Date: [10/20/95, 11/13/95; 12/22/95, 1/12/96; 3/1/96, 3/15/96

1/12/96, 1/26/96; 3/15/96, 3/29/96; 5/17/96, 5/31/96]

The [first, second, or third] phase of your participation in the Intervention Study [will be/was] completed as of Friday, [10/27/95, 1/5/96, 3/8/96; 1/19/96, 3/22/96, 5/24/96]. This is a reminder to return all intervention documentation materials to Lorna Volmer and Marty Ikeda in the Johnston Office. In doing so, remember to do the following:

1. Black out all potentially identifying information such as full names of the student, teachers, and parents.

2. Double check that you have the correct codes and information are in the top right corner of the first page of the intervention documentation materials—a ["B", "P", "T", or "R"], your zone name, and practitioner code.

3. Also check that the student's grade and gender is identified on the documentation materials.

If you have any questions please contact Lorna Volmer or Marty Ikeda in the Johnston Office.
APPENDIX M. REPEATED BASELINE DIRECTIONS
To: School Psychologists, Special Education Consultants, and School Social Workers in 
(Southwestern or Northern) Zones

From: Lorna Volmer, Marty Ikeda, and Kristi Flugum

Re: Directions for Second Phase of Intervention Study

Date: [10/27/95 or 1/19/96]

The first phase of your participation in the Intervention Study will be complete as of today. This following Monday will be the start of the second phase. This phase is the same as your first phase; you are to complete one problem-solving case and submit all intervention documentation materials. You may use any of the agency's intervention documentation forms provided in the Program Manual or any other method of documentation meeting the agency's criteria. Recall the requirements for this case:

1. The case must be one in which you have been actively involved in designing and/or implementing the intervention. AND

2. The intervention began and finished between the time frame of [10/30/95 and 1/5/96 or 1/22/96 and 3/22/96]. OR

3. The intervention began during the time frame of [10/30/95 and 1/5/96 or 1/22/96 and 3/22/96] and has been implemented a minimum of three weeks (submit all intervention documentation gathered up to [1/5/96 or 3/22/96]).

At the end of this phase ([1/5/96 or 3/22/96]), return all intervention documentation materials to Lorna Volmer and Marty Ikeda in the Johnston Office. When you do so, remember to do the following:

1. Black out all potentially identifying information such as full names of the student, teachers, and parents.

2. Double check that you have the correct codes and information in the top right corner of the first page of the intervention documentation materials—a "B", your zone name, and practitioner code.

3. Also check that the student's grade and gender is identified on the documentation materials.

4. Complete the question regarding the outcome the intervention.

If you have any questions please contact Lorna Volmer or Marty Ikeda in the Johnston Office.
APPENDIX N. LETTER TO PROTOCOL ONLY PHASE PARTICIPANTS
To: School Psychologists, Special Education Consultants, and School Social Workers in 
(Southeastern or Northeastern) Zones

From: Lorna Volmer, Marty Ikeda, and Kristi Flugum

Re: Directions for Protocol Phase of Intervention Study

Date: [10/27/95 or 1/19/96]

The first phase of your participation in the Intervention Study will be complete as of today. This following Monday will be the start of the second phase. Enclosed you will find an Intervention Documentation Protocol to complete on one problem-solving case for the second phase of this program. Recall the requirements for this case:

1. The case must be one in which you have been actively involved in designing and/or implementing the intervention. AND

2. The intervention began and finished between the time frame of [10/30/95 and 1/5/96 or 1/22/96 and 3/22/96]. OR

3. The intervention began during the time frame of [10/30/95 and 1/5/96 or 1/22/96 and 3/22/96] and has been implemented a minimum of three weeks (submit all intervention documentation gathered up to [1/5/96 or 3/22/96]).

At the end of this phase ([1/5/96 or 3/22/96]), return all intervention documentation materials (that is, the Intervention Documentation Protocol and any other relevant information) to Lorna Volmer and Marty Ikeda in the Johnston Office. When you do so, remember to do the following:

1. Black out all potentially identifying information such as full names of the student, teachers, and parents; the school, the student's date of birth, and phone numbers.

2. Double check that you have the correct codes and information in the top right corner of the first page—a "P", your zone name, and practitioner code.

3. Also check that the student's grade and gender is identified on the documentation materials.

If you have any questions please contact Lorna Volmer or Marty Ikeda in the Johnston Office.
APPENDIX O. QUALITY INDICES: INNOVATION CONFIGURATIONS
## Quality Indicators Innovation Configurations: Coding Scheme (page 1)

### Behavioral Definition

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Definition is (a) objective—refers to observable and measurable characteristics of behavior; (b) clear—so unambiguous that it could be read, repeated, and paraphrased by observers; and (c) complete—delineates both examples and nonexamples of the behavior.</td>
</tr>
<tr>
<td>4</td>
<td>Definition meets only two of the three criteria (i.e., objective, clear, complete).</td>
</tr>
<tr>
<td>3</td>
<td>Definition meets only one of the three criteria (i.e., objective, clear, complete).</td>
</tr>
<tr>
<td>2</td>
<td>Problem behavior is stated in general terms (e.g., reading comprehension, aggressive behavior, etc.).</td>
</tr>
<tr>
<td>1</td>
<td>Behavioral definition is not written.</td>
</tr>
</tbody>
</table>

### Indicator: Baseline Data

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>(a) The appropriate dimension(s) of the target behavior (FLITAD) have been identified; (b) A measurement strategy is developed answering how? what? where? who? and when?; and (c) Data collected on the behavior prior to implementing the intervention consisting of repeated measures of the target behavior over several (at least three) sessions, days, or even weeks until a stable range of behavior has been identified.</td>
</tr>
<tr>
<td>4</td>
<td>All three parts are present, however, the dimension(s) addressed are not the most appropriate for the selected target behavior, the measurement strategy does not answer all five questions, BUT the data were collected on the behavior prior to implementing the intervention consisting of repeated measures of the target behavior over several (at least three) sessions, days, or even weeks until a stable range.</td>
</tr>
<tr>
<td>3</td>
<td>Data collected on the behavior prior to implementing the intervention; however, only two data points are reported. Dimension(s) addressed and the measurement strategy may or may not be present.</td>
</tr>
<tr>
<td>2</td>
<td>Information present indicates baseline data were gathered, but data may or may not be present. Dimension(s) addressed and the measurement strategy may or may not be present.</td>
</tr>
<tr>
<td>1</td>
<td>Baseline data not gathered prior to implementing the intervention.</td>
</tr>
<tr>
<td>Indicator: Problem Validation</td>
<td>5 Discrepancy determined by comparing the student's current level of performance, documented using baseline, to a typical peer performance (e.g., local CBM norms, peer comparison data).</td>
</tr>
<tr>
<td>Indicator: Functional Analysis</td>
<td>5 Examined alterable factors from curriculum, instruction, environment and student domains using a variety of procedures (RIOT: review, interview, observe, test) to collect data from a variety of relevant sources and settings. Used this information to develop a specific intervention to change the behavior.</td>
</tr>
<tr>
<td>Indicator: Goal Setting</td>
<td>5 Goal stated narratively and represented graphically on performance chart specifying time frame, condition, behavior, and criterion.</td>
</tr>
<tr>
<td>Indicator: Intervention Plan</td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td></td>
</tr>
<tr>
<td>5 Plan stated (a) procedures/strategies, (b) materials, (c) persons responsible, (d) beginning dates, (e) review dates, and (f) decision making plan (i.e., defining specific measurement system, recording/graphing conventions, systematic data collection plan, and data analysis plan).</td>
<td></td>
</tr>
<tr>
<td>4 Plan stated procedures/strategies, materials, persons responsible, and decision-making plan, BUT no beginning or review dates.</td>
<td></td>
</tr>
<tr>
<td>3 Plan stated procedures/strategies and decision-making plan, BUT no persons responsible or materials (dates may or may not be present).</td>
<td></td>
</tr>
<tr>
<td>2 Generic descriptions of an intervention (e.g., behavior management) are stated. Decision making plan is not present or is informal and unsystematic. Persons responsible materials, and dates may or may not be present.</td>
<td></td>
</tr>
<tr>
<td>1 Intervention plan not written. OR Generic descriptions of intervention (e.g., behavior management) only.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator: Treatment Integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Degree of treatment integrity measured and monitored. Plan is implemented as designed, including decision-making rules. Intervention changed/modified as necessary on the basis of objective data.</td>
</tr>
<tr>
<td>4 Degree of treatment integrity addressed. Plan was implemented as designed and modified as necessary on the basis of subjective opinions.</td>
</tr>
<tr>
<td>3 Degree of treatment integrity addressed. Plan was implemented with variations from the original design with no basis for change stated.</td>
</tr>
<tr>
<td>2 Treatment integrity addressed, but intervention was not implemented as planned.</td>
</tr>
<tr>
<td>1 Treatment integrity not considered.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator: Progress Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Data are collected and charted/graphed 2-3 times per week. Appropriate graphing/charting conventions were used (e.g., descriptive title, meaningful scale captions, appropriate scale units, intervention phases labeled).</td>
</tr>
<tr>
<td>4 Data are collected and charted/graphed once a week. Appropriate graphing/charting conventions were used.</td>
</tr>
<tr>
<td>3 Data are collected and charted/graphed irregularly and infrequently (less than once a week, but more than pre and post). Appropriate graphing/charting conventions may or may not be used.</td>
</tr>
<tr>
<td>2 Data are collected but not charted or graphed. OR Only pre and post information was collected and/or charted/graphed.</td>
</tr>
<tr>
<td>1 Progress monitoring data not collected.</td>
</tr>
</tbody>
</table>
### Quality Indicators Innovation Configurations: Coding Scheme (page 4)

<table>
<thead>
<tr>
<th>Indicator: Program</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Evidence of both formative and summative evaluation. Progress monitoring data used to modify or change intervention as necessary. Outcome decisions are based on data.</td>
<td></td>
</tr>
<tr>
<td>4 Formative evaluation data gathered but not used to make decisions and changes in the plan. Summative evaluation outcomes based on data. Outcome decision stated.</td>
<td></td>
</tr>
<tr>
<td>3 No formative evaluation. Summative evaluation outcomes based on minimal data (i.e., pre and post tests). Outcome decision stated.</td>
<td></td>
</tr>
<tr>
<td>2 No formative evaluation. Summative evaluation outcomes based on subjective opinions. No indication of change or next step.</td>
<td></td>
</tr>
<tr>
<td>1 Intervention not evaluated.</td>
<td></td>
</tr>
</tbody>
</table>

### Definitions

**Outcome Decision** = Summary statement of results, effectiveness, and the next step.

**Data** = Numerical values of observable, measurable behavior.

**Information** = Narrative recording of student behavior.
APPENDIX P. LETTER TO EXPERT RATERS
Dear [NAME]:

As I mentioned during our conversation, I am currently working on my dissertation for my doctoral degree at Iowa State University under the guidance of Dr. Dan Reschly. My dissertation study examines the validity of best practices in intervention design and implementation using objective, permanent product indices of intervention quality. In addition, the study assesses the effect of protocol-based training on intervention quality and outcomes.

The "outcomes" is where you fit in. I have gathered self-report outcome information from practitioners (i.e., school psychologists, school social workers, and educational consultants) and teachers. Visual analysis using Kazdin's (1982) four characteristics also will be used to assess student outcomes. The final measure of student outcome is to be experts in assessment and intervention ratings of the success of the intervention.

Because of your expertise in the areas of assessment and intervention, I have asked you to be one of my expert raters. Using your knowledge of the problem behavior, expected rates of change, developmental norms, visual-analysis decision-making rules, and other relevant factors, you would classify the outcome of the intervention into one of four categories. My dissertation committee also requested ratings on the difficulty of change of the target behavior and the appropriateness of the intervention.

I have enclosed (#) cases with rating sheets. It should take you approximately 5 minutes to complete a case—(#) minutes for the entire sample. As soon as you have completed your ratings, you can return the cases in the enclosed self-addressed stamped envelope. My goal is to have all the cases returned to me by [DATE].

If you have any questions you can reach me at my home (515/232-5918) or via e-mail (KRFlugum@aol.com). Thank you very much for your time. It is greatly appreciated.

Sincerely,

School Psychologist
Heartland Area Education Agency
**Expert Rating**

Case No. __________

*Directions:* Incorporating your knowledge of the target behavior, expected rates of change, developmental norms, visual-analysis decision-making rules, and other relevant facts—in addition to your expertise in the area of assessment and intervention—please complete the following three items for the attached intervention documentation:

**Outcome:** (check one)

- [ ] Student performance improved greatly, this intervention was highly effective
- [ ] Student performance improved but not greatly, this intervention was somewhat effective
- [ ] Student performance did not change, this intervention was not effective
- [ ] Student performance got worse, this intervention was not effective
- [ ] There is not enough information to rate the effectiveness of the intervention

**How difficult to change is this target behavior?**  (circle one)

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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>Very Difficult</td>
<td>Somewhat Difficult</td>
<td>Somewhat Easy</td>
<td>Very Easy</td>
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**How appropriate was this intervention for the target behavior?**  (circle one)

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<tr>
<td>Very Inappropriate</td>
<td>Somewhat Inappropriate</td>
<td>Somewhat Appropriate</td>
<td>Very Appropriate</td>
</tr>
</tbody>
</table>
APPENDIX Q. HEARTLAND AEA’S 1997 INTERVENTION DOCUMENTATION FORMS
INTERVENTIONS SUMMARY

Pupil: (Last) (First) (MD (AICA)
B.D.: MM/DD/YY Sex: (Circle) M / F Grade/Level: Teacher(s)

Ethnicity (Circle): 00 (Unknown); 01 (Native American or Alaskan Native); 02 (Black Not of Hispanic Origin); 03 (Asian or Pacific Islander); 04 (Hispanic); 05 (White Not of Hispanic Origin); 06 (Other)

Primary language spoken in home (If other than English) Interpreter Needed Yes No

Legal Parent(s):
Address/City/State: (Zip):
Legal parent phone (H) (Work Number 1) (Work Number 2)

Other Parent(s):
Address/City/State: (Zip):
Other parent phone (H) (Work Number 1) (Work Number 2)

Legal Parent School District:
District/Building Student Attends:
District of Domicile:

A. Student Strengths

B. Initial Concern(s)

C. Summarize Previous Intervention(s) and Accommodation(s)

D. Date of Initial Parent Contact: / / Person Making Contact

E. Review of hearing screening completed by: Date / /
Hearing screening completed by: Title Date / /
Concern: Yes No Comments:

F. Review of vision screening completed by: Date / /
Vision screening completed by: Title Date / /
Concern: Yes No Comments:

G. Review of health history completed by: Date / /
Health history completed by: Title Date / /
Concern: Yes No Comments:

Distribution: (1) AEA, (2) School, (3) Parent, (4) Photocopy to resident district (if different) Revised June 1997
INTERVENTIONS SUMMARY (Page 2)

PUPIL: (Last) __________________________ (First) __________________________ Building __________________________

H. Educational History Review: Date ___/___/____ Completed by: __________________________

Previous schools attended ________________________________________________________________

Attendance Concern: Yes No Comments: _________________________________________________

Past Areas of Difficulty _________________________________________________________________

Past Placements or Services ______________________________________________________________

Pertinent Test Scores _________________________________________________________________

I. Problem Analysis Completed By: (Name) __________________________

Summary of Problem Analysis: (Summarize Problem Analysis or attach documentation. Include target behavior, assessment questions, data collected and results of data collection.)

J. Summary of Current Intervention: (Include outcome data.) __________________________

K. List members of problem solving team: _____________________________________________

L. AEA Case Coordinator: _____________________________________________________________

Distribution: (1) AEA, (2) School, (3) Parent, (4) Photocopy to resident district (if different) Revised June 1997
**INTERVENTION PLAN**

Name: ___________________________  Building: ___________________________  Date: ___________________________

**Problem Statement:**

- [ ] 
- [ ] 
- [ ] 
- [ ] 

**Goal:**

- [ ] 
- [ ] 
- [ ] 
- [ ] 

**Summary of Parental Participation:**

- [ ] 
- [ ] 
- [ ] 
- [ ] 

**Level of Performance Before Intervention (Baseline):**

- [ ] 
- [ ] 
- [ ] 
- [ ] 

<table>
<thead>
<tr>
<th>Procedures (Instructional Strategies):</th>
<th>Arrangements (Where/When/Materials):</th>
<th>Person(s) Responsible:</th>
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**Measurement Strategy** (Who's responsible for doing the actual data collection, method of data collection, measurement conditions, monitoring schedule):

- [ ] 
- [ ] 
- [ ] 
- [ ] 

**Decision Making Plan** (Frequency of strategies to be used to summarize data for evaluation, number of data points or length of time before data analysis, decision rule):

- [ ] 
- [ ] 
- [ ] 
- [ ] 

* Attach graph or other visual representation

**Follow-up Date(s):**

- [ ] 
- [ ] 
- [ ] 
- [ ] 

**Level of Performance After Intervention:**

- [ ] 
- [ ] 
- [ ] 
- [ ] 

**Final Disposition (check one):**

- [ ] Problem resolved
- [ ] Problem not resolved, redesign or modify intervention
- [ ] Problem not resolved, determine entitlement for special education
- [ ] Progress being made, but resources to continue intervention may be beyond what is reasonable for general education.

**DISTRIBUTION:**

- (1) AEA
- (2) School
- (3) Parent
- (4) Photo copy to resident district if different

Revised June 1997
REFERENCES


Iowa Department of Education (1994). *Student improvement is job #1: Monitoring student progress*. Des Moines, IA: Author.


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parents, Curtis and LaDonna. The love, friendship, and support from my siblings, Kari, Kandi, and Michael, also has been invaluable to me. To have accomplished such a task without the encouragement and understanding of my family would have been impossible—as well as meaningless.