Toward An Evidence-Based System for Innovation Support (Tools, Training, Technical Assistance, Quality Improvement/Quality Assurance) for Implementing Innovations with Quality to Achieve Desired Outcomes

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The Interactive Systems Framework for Dissemination and Implementation
Abstract

For an individual or an organization to implement a new technology, program, or policy (an innovation) usually requires support. A support system works with state and local entities (e.g., schools, coalitions, community-based organizations, clinics, mental health provider organizations) and individuals to build their capacity for quality implementation of innovations. The literature on the support system has been under-researched and under-developed. In the Interactive Systems Framework for Dissemination and Implementation, the effectiveness of a support system and its components will be largely determined by its ability to strengthen a delivery system’s capacity for implementing innovations with quality. This article begins to conceptualize theory, research, and action for an evidence-based system for innovation support (EBSIS). The EBSIS is a framework that outlines key priority areas for strengthening the science and practice of support. It is guided by a logic model/theory of change that includes an initial capacity assessment, followed by the provision of four key support components: tools, training, technical assistance (TA), and quality improvement/quality assurance (QI/QA). In the EBSIS, each of the four support components uses a results-based accountability approach (Getting To Outcomes®), which allows for the identification and synthesis of best practices. In concluding with a discussion of research and practice implications of EBSIS, we suggest use of collaborative researcher-practitioner partnerships to help accelerate the field of evidence-based systems for innovation support.
If we are to achieve better outcomes in public health, education, and other social programs, we need to implement appropriate innovations (e.g., programs, policies, processes) with quality. An innovation is something that is new to an individual or organization. Bridging the gap between research and practice is an essential ingredient for quality implementation of effective innovations. In collaboration with Divisions at Centers for Disease Control and Prevention (CDC), the Interactive Systems Framework for Dissemination and Implementation (ISF) was developed to bring funders, researchers, evaluators, and practitioners together in a way that integrates research-to-practice models with community-centered (practice-centered) models (Wandersman, Duffy, Flaspohler, Noonan, Lubell, et al., 2008). The ISF has three interacting systems that, together, offer a framework for bridging research and practice. The systems are: (1) synthesis and translation of innovations (e.g., effective programs, policies, processes, and principles), (2) support for building capacity for implementation of the innovation, and (3) delivery of the innovation. (Several key terms are defined in Table 1).

The support system plays a crucial role in building the capacity of state and local entities (e.g., schools, coalitions, community based organizations) to implement innovations. The support system has been under-researched and under-developed. Thus, the evidence-base on effective support is very limited. One of our major goals is to enhance the science and practice of support to improve implementation outcomes.

In this article, we provide a conceptualization of theory, research, and action for an Evidence-Based System for Innovation support (EBSIS). The major goal of the EBSIS is to improve the research and practice of evidence-based support in order to build capacity in the delivery system for implementing innovations with quality, and thereby, achieve results. The effectiveness of EBSIS and its components will be largely determined by its ability to build innovation-specific capacity and/or general capacity in the delivery system.

In the original ISF concept article (Wandersman et al., 2008) and subsequent discussions, there was a realization that major gaps existed between the systems. We conceptualize the EBSIS as extending from the ISF’s support system to the delivery system, as an operationalization of how the two systems interact. (See Figure 1). Below, we present the EBSIS logic model and its four support components.
An Overview of the Evidence-Based System for Innovation Support (EBSIS) Logic Model

In the ISF, the EBSIS logic model can be applied to support many types of innovations (e.g., programs, policies, processes). The EBSIS logic model begins with the identification of desired outcomes to be achieved, which is followed by an assessment of initial capacity for achieving the desired outcomes (See Figure 2). Entities (e.g., individuals, programs, organizations, and communities) differ in their initial capacity to implement an innovation (Flaspohler, Duffy, Wandersman, Stillman, & Maras, 2008). Collecting baseline data about capacity allows for the support system to be customized to the needs and resources of the entity. Baseline capacity data can also help to clarify an entity’s assumptions and expectations for support (Sieber, 2008). The support system for building required capacity is comprised of four chief components: tools, training, technical assistance (TA), and quality improvement/quality assurance (QI/QA). These four components leverage empirical data to identify best practices, and thereby, support or contribute to quality adoption and utilization of an innovation. The components can also be used to enhance general-organizational capacity in the ISF. In this manuscript, we focus primarily on how the support system builds innovation-specific capacity.

Relationships among the Four EBSIS Components (Tools, Training, TA, QI/QA)

During the process of adopting an innovation, informational tools such as manuals, guides and checklists can serve as an ideal starting place. They can be used for educational, planning, monitoring, and evaluation purposes. However, tools by themselves are often insufficient when an entity seeks to adopt and implement a new innovation. Training on how to use and interpret the tools is important for ensuring that end-users have a clear and common understanding of the tools. Although trainings are commonplace, the successful transfer of training into utilization is a persistent challenge (Bartholomew et al., 2007; Blume et al., 2010; Cheng & Ho, 2001). Post-training interventions—the formal use of strategies to support training transfer and promote further skill development—are known to be critical to training effectiveness (Gist et al., 1990; Richman-Hirsh, 2001; Tews & Tracey, 2008). A major form of post-training intervention is technical assistance (TA) where customized one-on-one coaching and feedback is provided to end-users. TA providers recognize that entities differ in their capacities and learning needs, and that these needs change. In addition, TA providers have experiential insight into the
process of adopting an innovation and can assist with obtaining resources and overcoming challenges. The *quality improvement/quality assurance* component of the support system serves to ensure that the practitioners are accountable and implementing with quality. It is a mechanism for identifying and correcting performance gaps. Each of the components in the support system is designed so it could function independently; however, the benefits of the components are optimized when engaged in tandem.

Structuring the Evidence Base for Tools, Training, TA, and QI/QA

Our goal in the EBSIS is to enhance the science and practice of evidence-based support. More specifically, we are interested in identifying and synthesizing best practices for support in order to build innovation-specific and general capacity. In the EBSIS, we use the Getting To Outcomes® (GTO®) framework to organize the theory, research, and practice for each of the four support components. GTO is a 10 step approach to results-based accountability that includes, planning, implementation, evaluation, and sustainability (Wandersman, Imm, Chinman, & Kaftarian, 2000; see Table 2 for the 10 steps of GTO). Using GTO enables the systematic accumulation of knowledge for each component. In essence, the GTO steps provide a structure for organizing information in a way that is accessible to researchers and practitioners. In the following sections, we provide a frame for the development of an evidence-based system for innovation support that will be filled with present and future evidence-based practice and practice-based evidence on how to perform each component with quality. This is outlined in Table 3.

Tools

In the support system, *tools* refer to informational resources designed to communicate knowledge asynchronously (a non-live, pre-recorded or pre-developed fashion), in order to support general organizational capacity and/or innovation-specific capacity. Tools include, but are not limited to, books, journals, manuals, guides, pamphlets, worksheets, templates, spreadsheets, and checklists, where information is generally text- and graphic-based. Traditionally, informational tools largely existed in paper format. However, since the advent of the World Wide Web, there has been a rapid shift toward publishing tools online (Mizzaro, 2003).
The modern workforce is chiefly comprised of knowledge-workers—individuals who work primarily with information or who develop and use knowledge in the workplace (Drucker, 1999). It is estimated that the proportion of knowledge workers to all other workers (e.g., agricultural, industrial) is four to one in the U.S. (Haag et al., 2006). The shift toward information-centered work in recent decades has spawned a heightened appetite for informational tools by organizational members, which has been largely met by the flurry of new tools developed and disseminated via the internet. However, in many ways, the internet has relaxed the traditional standards of publishing informational tools (Mizzaro, 2003). Informational resources shared online are often unregulated, requiring organizations to pay more attention to issues of information quality assurance. Information quality is a multi-dimensional construct that broadly refers to the value of information to a user (Lee, Strong, Kahn, & Wang, 2002).

**Importance of Quality Information**

The quality of information consumed drives all aspects of an organization’s performance, including the quality of decision making and implementation. Thus, access to quality informational tools is important for cost-efficiency and organizational effectiveness. Poor or inadequate tools can lead an activity astray, resulting in undesirable short- and long-term consequences (e.g., temporal and financial waste, decreased organizational morale and confidence among stakeholders). Misinformation can have serious adverse health consequences for consumers also (Eysenck & Jadad, 2001). Conversely, research in the healthcare setting shows that effective tools, such as well-written clinical practice guidelines, can improve the quality and consistency of health care (McLauhghlin, Sourmerai, Eilson et al., 1996; Grimshaw et al, 1993; Thomas et al., 2002).

**An Evidence-based Approach for Tools**

Tools can fall short of their intended benefit when they are outdated, poorly organized, overly complex, or misinformed. A common problem is that many tools are designed with minimal input from the users (Trivedi, Kern, Marcee et al., 2002). However, research suggests that involving user input may not be sufficient because usability does not necessarily equate with learning (Squires & Preece, 1996). Therefore, it is also critically important that tool design and
development be informed by educational, cognitive and informatics research. The design and
development of a quality tool involves a systematic process that is evidence-based and user-
centered. The systematic accountability approach of GTO makes it a fitting heuristic for
developing/adopting a quality tool. The section below provides a brief description of the key
steps to developing or adopting a quality tool using the GTO steps.

*Conducting a Needs and Resource Assessment (GTO Step 1)*

The impetus to acquire or develop an informational tool is generally stimulated by some
task-related need (Ho & Antunes, 2002). Conducting a needs assessment for this support
component involves examining the current availability of tools in the workplace to clarify the
gap between existing and newly needed instruments. Taking time to survey an organization’s
existing stock of tools contributes to cost-savings by reducing the likelihood that duplicate or
unnecessary investments are made in new tools. In addition, the process can contribute to
clarifying the specific task-related needs associated with the tool. GTO step 1 also involves
considering the resources available for acquiring or developing a newly needed tool. The
availability of resources informs the extent of investment that can be devoted to tool
development or acquisition.

*Establishing Goals and Desired Outcomes (GTO Step 2)*

This step involves determining the broad purpose of a tool and its specific desired
outcomes, which should be informed by the needs and resource assessment and completed
collaboratively with target end-users. When determining the desired outcomes of the tool, it is
important to consider what informational and functional requirements the tool should accomplish
(Ho & Antunes, 2002). The goals and desired outcomes of the tools established in this step
inform the content, format, and function of the tool.

*Identifying Best Practices (GTO Step 3)*

Whether the decision is made to develop a new tool or to acquire/adapt a pre-existing
tool, it is important that the instrument captures the features of a quality tool. Research on
information quality (IQ) identified 16 essential dimensions of quality information: accessibility,
appropriate amount of information, believability, completeness, concise representation,
consistent representation, ease of manipulation (i.e., the extent to which the information can be applied to different tasks), free-of-error, interpretability, objectivity, relevancy, reputation, security, timeliness, understandability, value-added (Kahn, Strong, & Wang, 2002). The U.S. Department of Defense has established a set of guidelines for IQ that is advocated by the MIT Total Data Quality Management Program. The criteria focus on accuracy, completeness, consistency, validity, timeliness, and uniqueness dimensions of IQ (Lee, Strong, Kahn & Wang, 2002). Similar dimensions for IQ have been identified in other studies. For example, in a study examining information quality of a community-based encyclopedia, the following seven IQ metrics were used: scope, format, uniqueness, authority, accuracy, currency, and accessibility (Stvilia, Twidale, Smith & Gasser, 2005). In the medical literature, guides that are valid, reliable, clinically relevant and evidence-based result in better clinician adherence to recommendations within the guidelines (Groi, Daihuijsen, Thomas et al., 1998). When examining best practices for a tool of interest, it is also important to consider the set of theories (e.g., cognitive, constructivist, motivational theories) that are salient to the use of information. This process ensures that a developed/selected tool is adequately user-centered.

**Addressing Issues of Fit (GTO Step 4)**

Upon considering best practices for the tool of interest, it is important to address issues of fit. These issues fall into several categories: (1) fit with task-needs; (2) fit with end-user (e.g., reading level, cultural sensitivity, format, level of detail); (3) fit with organizational practices and infrastructure (e.g., adequate technological supports and policies/procedures to support use of tool). Studies pertaining to issues of fit for tools have largely examined fit issues between the tool and its end user. Research demonstrates that what is considered a quality tool from a designer’s perspective may differ from the user perspective (Hiruma & Kaiho, 1991). Engaging the end-user in the tool development process can improve alignment between the purpose of the tool and the needs of the end-user.

**Considering Capacity Issues (GTO Step 5)**

Capacity considerations are necessary whether one is using an existing informational tool or developing a new tool. Addressing capacity issues for using an existing informational tool
involves identifying the human, fiscal, technological, and material resources necessary for obtaining the tool, learning how to use it, and adapting the tool as required. Although developing a new informational tool can be resource intensive and costly (McConnon, Kirk, & Cockroft et al., 2007), it is often the desirable alternative when existing tools do not meet the needs of the innovation. A variety of capacity issues should be considered including availability of time, staff, money and technological support (Clement, Wilson, & Bingham, 2002). For example, are there sufficient financial resources to afford the tool, and for what length of time? Is there a one-time cost, or are costs enduring? Is there sufficient staff expertise to develop the tool or are additional specialists needed? In addition, capacity issues pertaining to implementation of the tool should be considered in this step. For instance, will use of the new tool require investment in new technology (e.g., software or hardware)?

Developing a Plan (GTO Step 6)

It is important to develop a clear plan for use whether the decision is to create a new tool or adopt a pre-existing tool. This involves anticipating and addressing barriers associated with access to information. Informatics researchers Eysenbach and Jadad (2001) suggest addressing how consumers can access information when and where they need it, and in the amount and format in which they need it during the planning phase. In healthcare settings, these barriers to information access are problems for both patients and providers (Eysenbach & Jadad, 2001). However, patients and providers are also known to grapple with their own unique set of challenges to information access. For example, much online patient educational material is written at a reading level that is higher than the estimated average U.S. reading level (Graber, Roller, & Kaeble, 1999), limiting patient use of the information. And while providers are literate consumers of medical literature, they commonly lack sufficient time to familiarize themselves with new information (Eysenbach & Jadad, 2001). To ameliorate the array of challenges associated with information access and use, a plan for tool implementation should be developed using a collaborative approach whereby end-user input is recruited. If a new tool is being developed, detailed plans for development should be prepared and shared with end-users and other stakeholders (e.g., top management, partnering agencies, patient population).

Implementation and Process Evaluation (GTO Step 7)
While developers often do not have time to test a tool before release; it is common for them to have to take time to respond to errors and inaccuracies after product release (Parnas & Lawford, 2003). Inspection of and piloting the tool prior to full release is important for quality assurance and consumer satisfaction, and should be viewed as part of the implementation phase. During process evaluation, it is important to use a systematic approach that involves several reviewers (Parnas & Lawford, 2003). Product monitoring is an on-going activity that should continue into the product launch phase to ensure that the tool continues to achieve its intent. Careful documentation of changes made to the tool should be kept for communication and record-keeping purposes. The need for greater information quality control has produced a variety of tools for information quality assurance (see Mizzaro, 2003; Lee et al., 2002; Whiting, Rutjes, Reitsma, Bossuyt & Kleijnen, 2003; Kitchenham & Pickard, 1995).

Conducting an Outcome Evaluation (GTO Step 8)

This step involves assessing the extent to which the goals/desired outcomes of the tool (established in GTO Step 2) are achieved during full implementation. Evaluation of outcomes should take contextual factors into consideration, such as the characteristics of the user and workplace as these factors are linked to implementation effectiveness (Mumtaz, 2000). Metrics for evaluating outcomes can be guided by best practices literature (e.g., Information Quality dimensions; Kahn et al., 2002). Using a multi-method, multi-informant approach increases validity of data (Kraemer, Measelle, Ablow, Essex, Boyce & Kupfer, 2003).

Engaging in Continuous Quality Improvement (GTO Step 9)

To keep a tool current and useful requires routine updates. Suggestions for revisions should be driven by end-users, evidence of utility, changes in the workplace (e.g., staffing, funding) and macroeconomic factors (e.g., technology, policy, economic; e.g., Ayusawa, Sonobe, Uemura et al., 2005). Prior to formal changes, intended revisions should be reviewed by end-users to see that changes are useful. If substantial CQI revisions are made, it may be necessary to provide additional training on how to use the tool. When redistributing to veteran users, the dissemination of revised tools should include a summary of changes.

Addressing Sustainability Issues (GTO Step 10)
Sustaining a new tool involves making sure there is ongoing capacity to produce, disseminate, and support the tool. It also involves making on-going revisions (GTO Step 9), as well as engaging in translation and marketing activities for tool dissemination. Translation activities can involve language (e.g., English to Spanish), format (non-virtual to virtual), design (text to video), or content (length: full to abridged version, versions for different ages).

Sustainability of a tool is largely linked to its intrinsic quality such that tools that perform better on the IQ dimensions will add greater value to end-users, and thus, be in greater demand.
Training

In the evidence-based system for innovation support, we define \textit{training} as a curriculum-guided, instructional activity intended to facilitate the acquisition of knowledge, skills, and attitudes so to enhance learner performance. Training is often performed in group settings. \textit{Training effectiveness} refers to the extent to which the training objectives are achieved. The concept of training effectiveness exists on a continuum, with \textit{quality training} indicating the fullest state of training effectiveness.

\textit{Brief Review of Training}

In pursuit of a model to guide the implementation of quality training, a literature review was conducted on training (Chien, 2010). The results of the review were illuminating. Over the last half-century, models for training have become increasingly more comprehensive as they have moved from focusing strictly on training outcomes (Kirkpatrick, 1959) to encompassing individual, contextual and programmatic factors that influence training outcomes (Cannon-Bowers et al., 1995; DeMatteo, Dobbins, & Lundby., 1997; Rowold, 2007; Scaduto, Lindsay & Chiaburu, 2008; Tai, 2006). However, despite significant strides, the field continues to lack a model that fully captures a central quality of training, namely the \textit{systematic process} important to achieve effective trainings. Bartholomew and colleagues (2007) expressed the need for a new model that assists researchers and practitioners with examining the full training process. This would allow for more systematic studies of training in order to ascertain the effectiveness of training as well as to know what components to consider when planning for an effective training. In sum, the literature review of training revealed that improving the quality of training programs requires a comprehensive model of training that captures key features of the training process—extending from the needs assessment phase to evaluation of organizational impact.

\textit{Core Features of Quality Training}

In this section, we briefly describe key training characteristics and processes that have been empirically recognized to impact training outcomes. These factors can be actively leveraged to achieve quality training. A more detailed review of core factors influencing training effectiveness can be found in Chien (2010).
Training Characteristics. Three sets of variables are related to quality training: 1) those that have an impact across the stages of training (i.e., before, during, and after the training program; referred to as system performance indicators), 2) those that are specific to the training program (program-specific indicators), and 3) those that relate to training outcomes (outcome indicators). Eleven system performance indicators, existing at the individual or organizational level, have been identified. The individual level variables relate to characteristics of the trainee (e.g., training motivation, self-efficacy, cognitive ability, personality type, work-related attitude, trainee age). The organizational level variables are associated with aspects of the organization that the trainees belong to (e.g., organizational support, culture, resources, opportunity to perform, accountability). Overall, the literature suggests that trainees who are high in training motivation, self-efficacy, cognitive ability, and job involvement/organizational commitment and who are achievement-oriented will achieve better training outcomes. In addition, positive training outcomes are dependent on trainees feeling accountable for trained materials, receiving top-down support and opportunities to perform, and being immersed in a learning environment.

Program-specific indicators include seven variables that relate to either the trainer or the training program. Trainer variables include competence, curriculum-compliance, and trainer-trainee relationship. Training program variables include training environment, training expectations, curriculum fit, and post-training intervention. Although aspects of the training interval are important to training outcomes, the literature is limited.

The literature review identified seven outcome indicators at the individual or organizational level. The individual level included trainee reactions (utility & affective), learning (immediate recall, long-term recall, behavioral demonstration), and transfer are important indicators of training quality. The organizational level included return on investment.

Training Process. Five empirically-informed frameworks for training were examined to elicit core stages involved in the process of training (Kirkpatrick, 1959, Brinkerhoff, 1988; Bushnell, 1990; Cannon-Bowers, Salas, Tannenbaum & Matthieu, 1995; Allinger, 1997). The following stages surfaced from the review: needs assessment, goal identification, design and development, delivery, evaluation, and quality improvement. Training models by Bushnell (1990) and Cannon-Bowers, Salas, Tannenbaum & Matthieu (1995) propose that the training process begins with an assessment of training needs. In the Bushnell (1990) model, the needs assessment is followed by identification of training goals. Next, the training process involves
designing, developing and delivery of the training program (Brinkerhoff, 1988; Bushnell, 1990). Finally, the most widely recognized training stage across the models is evaluation of training outcomes (Kirkpatrick, 1959; Brinkerhoff, 1988; Bushnell, 1990; Alligner, 1997). Of the reviewed models, only the model by Bushnell (1990) includes a feedback loop whereby outcome data is used to inform program improvement. Interestingly, none of the models directly attend to the process of training transfer (i.e., implementation of the trained materials on the job), an essential determinant of training effectiveness (Blume et al, 2010; Cheng & Ho, 2001). The process of sustaining an effective training program is also absent across the models. The six stages of training extracted from the reviewed empirical models closely overlap the well-established, practitioner-developed model known as the AIDDIE model: analysis, design, develop, implementation, and evaluation (Molenda, 2003).

An Evidence-based Approach for Training: Training For Outcomes (TFO)

Extending from Chien’s (2010) literature review of training, the Training For Outcomes (TFO) Model was developed to address the need for a more systematic and comprehensive model for training effectiveness (Chien & Wandersman, 2011). Below, we provide an overview of the TFO model; it serves as a framework for increasing the probability of achieving quality training. The TFO model borrows from two empirically established, systems-based approaches, Getting To Outcomes (Chinman, Imm, & Wandersman, 2004) and the Input-Process-Output-Outcome (IPO) framework (Bushnell, 1990). TFO conceptualizes training as a process, rather than a single event.

The TFO model begins with the recognition that there is a set of empirically demonstrated factors, referred to as system performance indicators (SPIs), which contribute to the overall effectiveness of training. The SPIs comprise the Input phase of the TFO model. The needs assessment and development of training goals also fall under the Input phase. The Process phase of the TFO model guides training professionals through the development, implementation, and improvement/sustainability stages of training. The central feature of the training Process phase is the process evaluation, which serves as a feedback loop to facilitate program improvement. The last phase of the TFO model is the Output/Outcome phase whereby the quality of the training is examined. The section below provides a brief description of TFO using the GTO steps.
Conducting a Needs and Resource Assessment (GTO Step 1)

The first step involves clarifying the training needs and resources of the target organization. This involves conducting five types of analyses: performance, organizational, task, person, and value analysis. A performance analysis is used first to rule out the possibility that existing gaps are related to non-training issues. Next, an organizational analysis is completed to collect information about the target organization (McGehee & Thayer, 1961). This is followed by a task analysis which aims to identify the specific knowledge, skills, and attitudes that the training seeks to grow (Carnevale, Gainer, & Meltzer, 1990). Then, the target audience (trainees) should be identified via a person analysis (Noe, 2010). Individual level factors of the TFO Input phase should be assessed during the person analysis. Lastly, a value analysis should be completed to ensure that the benefits of training outweigh the costs. A copy of the five analysis tools can be found in the Guide to Training For Outcomes (Chien & Wandersman, 2011).

Establishing Goals and Desired Outcomes (GTO Step 2)

The second stage of the process phase involves goal-setting, whereby the specific aims of training are determined based on needs assessment data. To increase buy-in across the levels of an organization and the alignment with organizational culture, training goals are best defined in collaboration with organizational stakeholders (Bramley, 1991). In addition, it is important to link training goals to organizational goals (Hughey & Mussnug, 1997; Lingham, Richley & Rezania, 2006). This connection can facilitate evaluation of organizational outcomes (Mahapatra & Lai, 2005), or the impact of training. The goals and desired outcomes established in GTO Step 2 are revisited in the Output/Outcome Phase (Outcome Evaluation –GTO Step 8) to inform training effectiveness.

Identifying Best Practices (GTO Step 3)

It is not uncommon for trainers to deliver trainings using methods that are familiar to and convenient for them, rather than to allow training decisions to be driven by the training goals and characteristics of the trainees. However, devoting additional time to exploring and evaluating different training methods based on data collected from GTO Steps 1 and 2 ensures training
efficiency and effectiveness. Identifying best practices for training involves reviewing training literature for evidence-based strategies that best address training goals. The aim of this step is to enhance the probability of training success by using evidence-based literature to select training strategies that are associated with particular desired training outcomes. Training experts have begun to recognize the importance of narrowing the research-practice gap in training. However, much research is needed on how training outcomes are impacted when evidence-based practices are deliberately incorporated in the training design.

Addressing Fit Issues (GTO Step 4)

Upon identifying a set of best practices for your training, it is necessary to evaluate each best practice based on your training goals and targeted training population. This step is important because the effectiveness of your training program is directly linked to how well the training approach and curriculum both satisfy the goals/desired outcomes of the training and complements the characteristics of the trainees. It ensures that the training is relevant for the trainees and that the target organization sees a positive return on its training investment.

Considering Capacity Issues (GTO Step 5)

Training involves a variety of human, instructional, technical, and physical capacities. Training research shows that inadequate capacities can interfere with attainment of training objectives (Bartholomew, Joe, Rowan, Szal, & Simpson, 2007). The aim of GTO Step 5 for training is to address the capacity needs of a training program. This step begins with determining the capacities needed for the training, and proceeds with clarifying those capacities which are available from those which need to be obtained. A concrete plan for capacity acquisition should be developed during this step. Although it is well-recognized that capacities are critical for successful training outcomes, there is a surprising dearth of empirical literature on the relationship between the availability of capacities that organizations have for training and training outcomes.

Developing a Plan (GTO Step 6)

A training plan serves as your roadmap for implementation. It describes the tasks, roles, schedules, and methods of the training. It can be used for progress monitoring, as well as a tool for accountability. Planning for a training program involves: a) developing a training design,
addressing training logistics, and addressing anticipated implementation barriers, b) determining what processes will be used to facilitate the transfer of training materials into the workplace, c) ensuring that employees and organizational leadership are fully informed about the training. Engaging members of the organization in the planning process is important for achieving program outcomes (Alliger et al., 1997). A well-developed plans improves the probability of implementation quality and thereby, contribute to results.

Implementation & Process Evaluation (GTO Step 7)

Conducting a process evaluation allows you to know if the training is going as planned, and allows for the identification of implementation issues as they arise. Organizing a process evaluation involves developing a plan for monitoring the quality of the training program and associated post-training activities. It also entails creating and adapting process evaluation instruments.

Conducting an Outcome Evaluation (GTO Step 8)

An outcome evaluation is conducted in the Output/Outcome phase of the TFO system. The purpose of an outcome evaluation is to determine training effectiveness, or the extent to which training goals were met. The literature review of for training effectiveness indicates that outcome evaluations for training are generally measured at the individual and organizational levels (Chien, 2010). At the individual level, training outcomes can assess affective and utility reactions, different levels of learning (e.g., immediate recall, long-term retention, behavioral demonstration), and transfer. At the organizational level, common measures for training outcomes include return on investment and customer satisfaction.

Engaging in Continuous Quality Improvement (GTO Step 9)

Conducting a CQI process is critical for making improvements to future trainings. This step is designed to clarify which activities should be continued, and which require improvement. The aim GTO Step 9 is to make improvements to the training program in order to increase the probability of future training success. Engaging in continuous quality improvement involves a collective review of all the previous training steps you have completed. The process and
outcome data from GTO Steps 7 & 8 are very important for this step. Addition research is needed on the role of quality improvement activities for training.

**Addressing Sustainability Issues (GTO Step 10)**

When a training program successfully achieves its desired outcomes, there is value to sustaining it. Addressing sustainability for training involves preserving the core components of a training program. The process involves ensuring sufficient capacity and infrastructure for program continuation, establishing a repertoire of effective training strategies and best practices, routinizing training activities, and ensuring that trainings have beneficial outcomes (Chien & Wandersman, 2011). Existing training literature largely focuses on the development and delivery of training. Additional research on the process of sustaining training programs is needed.

**Technical Assistance**

*Technical assistance (TA)* is defined as an individualized, hands-on approach to building capacity within individuals, organizations, and/or communities, usually following (Chinman, Hannah, Wandersman, Ebener, et al., 2005; Keener, 2007). TA that is provided to strengthen general organizational capacity in the ISF addresses variables such as leadership development, funding/resource development and access to resources, practitioner empowerment, competence, and capacity for future efforts (Butterfoss, 2004; Flaspohler et al., 2008; Stevenson, Florin, Mills, & Andrade, 2002), access to resources (Fawcett, Paine-Andrews, Francisco, Schultz, et al., 1995); Gibbs, Napp, Jolly, Westover, et al., 2002). TA that is delivered to strengthen innovation-specific capacity in the ISF targets variables such as awareness and knowledge of the innovation, selection of staff implementers, and potential for sustainability (Flaspohler et al., 2008).

**Brief Review of Technical Assistance**

Knowledge of best practices in TA is at an early stage, and the literature on TA has emphasized a limited number of dimensions. There is a growing evidence-base for four dimensions of TA – dosage, mode of delivery, collaborative design, and proactive design. Each of these dimensions will be discussed in turn.
Dosage

There are benefits to the provision of ongoing TA in contrast to temporary or circumstance-limited TA (Spoth, Claire, Greenberg, Redmont, et al., 2007). Chinman et al. (2008) found that more TA hours are correlated with improvements in the implementation of prevention programming (e.g., capacity building, development of outcome evaluations). Higher doses of on-site TA suggest improvement (although not statistically significant) in functioning of youth development programs in the Communities that Care program (Feinberg, Ridenour, & Greenberg, 2008). However, two studies found no significant effect on positive program outcomes with variation in dose (Keener, 2007; Mihalic & Irwin, 2003). There have been suggestions about variables that may moderate the relationship between TA dosage and observed outcomes, and therefore, account for variability in these findings, e.g., the developmental phase of TA recipients (Feinberg et al., 2008).

Mode of Delivery

The provision of TA can occur on-site, or via telephone calls, interactive web sites, and electronic mail (Keener, 2007). Given that on-site TA is more likely to afford opportunities for experiential learning and the demonstration of relevant skills (Becker et al., 2008), it is not surprising that research has found that TA delivered on-site provides greater support to communities than TA via telephone or email (Feinberg et al., 2008). However, there may be unique benefits associated with web-based TA (e.g., Young, Montgomery, Nycum, Burns-Martin, et al., 2006).

Collaborative Design

It is important to balance TA expertise in substantive areas with interpersonal and group facilitation skills (Wesley & Buysse, 1996). Studies have reported benefits to collaboration between multiple stakeholders in planning for TA (Spoth et al., 2007). This may include collaboration with consumers and their families, practitioners and administrators, and researchers and funders (Salyers, McKasson, Bond, McGrew, et al., 2007).

Proactive TA

Collins, Harshbarger, Sawyer, & Hamdallah (2006) and Keener (2007) distinguish between proactive and reactive TA. Unlike reactive TA (which is requested by consumers or practitioners), proactive TA provides support and assistance through assertive outreach (Keener,
In contrast to reactive TA, proactive TA involves anticipating TA needs and catalyzing the TA process rather than waiting for TA requests to arrive (Collins et al., 2006). Proactive TA is important because communities with lower capacity levels are less likely to make TA requests (Kegeles et al., 2005), due to either not understanding the benefits of TA (Keener, 2007) or the steps involved in making TA requests (Kegeles et al., 2005). There is a growing literature supporting the benefits of proactive TA (Fagan, Hanson, Hawkins, & Arthur, 2003; Kelly et al., 2000; Mihalic & Irwin, 2003; Mitchell, Stone-Wiggins, Stevenson, & Florin, 2004; Quinby, Hanson, Brooke-Weiss, Arthur, Hawkins, et al., 2008).

*An Evidence-Based Approach to Technical Assistance*

Evidence-based TA should incorporate the best available evidence on the provision of TA. Existing TA research tends to focus on the effectiveness of specific TA support strategies (e.g., a certain dosage of TA). However, if TA is to improve system capacity outcomes, the use of specific TA support strategies is necessary but not sufficient. Quality TA involves the use of 1) evidence-based TA support strategies and 2) comprehensive TA programming for planning, implementing and evaluating those evidence-based TA support strategies. Comprehensive TA programming includes ten results-based accountability steps.

*Conducting a Needs and Resources Assessment (GTO Step 1)*

A needs and resource assessment provides a basis for determining the extent to which a delivery system requires TA for strengthening innovation-specific capacity, general capacity, or both. Few capacity assessments provide psychometric information (Sobeck & Agius, 2007). Florin, Mitchell, & Stevenson (1993) provide an alpha coefficient for a capacity assessment tool used as part of a coalition-building project. An example of a tool for assessing capacity is a multi-dimensional organizational capacity assessment developed by the Marguerite Casey Foundation (2007), which has sub-scales for quantifying the capacity dimensions of leadership, adaptive management, and operational capacity.

*Establishing Goals and Desired Outcomes (GTO Step 2)*

TA goals and desired outcomes are developed based upon information obtained from the needs and resource assessment. Goals are broader than desired outcomes; outcomes should be specific e.g., SMART (Specific, Measurable, Attainable, Realistic, and Time-bound). Desired TA outcomes can be defined by benchmarks that are based upon available evidence (Salyers,
Letts, Ryan, and Grossman (1999) describe several types of desired TA outcomes, including indicators of capacity to: do preexisting work with increased quality, grow or do new work, adapt to challenges as they occur over time.

**Considering Best Practices, Fit, & Capacity Issues (GTO Steps 3-5)**

The TA literature is used to select evidence-based TA strategies. A key premise for selecting evidence-based TA strategies is that not all TA strategies are created equal; some strategies work better than others, some are more cost-effective than others (Step 3). When selecting evidence-based TA strategies, providers should ensure that the strategies are consistent with the values and cultures of TA providers and recipients alike (Step 4). TA is more likely to have a positive impact when the TA provider uses strategies that fit with the communities being served (O’Donnell, Scattergood, Alder, San Doval, & Al, 2000).

It is also important to ensure sufficient capacity – including human, fiscal, and technical resources – to deliver selected evidence-based TA strategies with quality (Step 5). TA requires substantial resources (Florin et al., 1993), including internal staffing, linkages with content experts and researchers, and fiscal resources including funds for travel or equipment (Salyers et al., 2007).

**Developing a Plan (GTO Step 6)**

TA planning addresses the “who, what, where, when, and how” of conducting TA. The TA plan serves as the roadmap for TA implementation. TA plans are often developed and used in a climate of limited evidence about how TA plans should be structured and used. An example of a TA plan is the Proactive TA Plan, developed by the South Carolina Campaign to Prevent Teen Pregnancy, which includes action steps for TA, target end dates, individuals responsible for action steps, and selection of indicators for determining the accomplishment of action steps. An important component of a TA plan is documentation of tasks and responsibilities for both TA providers and recipients (Feinberg Greenberg, & Osgood, 2004).

**Implementation and Process Evaluation (GTO Step 7)**

TA providers implement the TA plan that was developed in Step 6 and conduct a process evaluation. Process evaluation provides feedback about the extent to which delivery of TA strategies are on target, and identifies areas requiring mid-course corrections (Nemec, Forbess,
Cohen, Farkas, Rogers, et al., 1991). A database can be used to monitor dosage of TA (e.g., number of hours) and fidelity to the TA plan (Durlak & DuPre, 2008) among other TA relevant factors.

Conducting an Outcome Evaluation (GTO Step 8)

An outcome evaluation provides information about the extent to which the goals and desired outcomes (established in GTO Step 2) have been met. Although specifics will vary by TA project, the general TA outcome evaluation question will be the same, namely, “were the delivery system’s innovation-specific and/or general organizational capacities enhanced as a result of TA?” Blumenthal’s review (2003) found that evaluation designs for TA are often “black box” evaluations that are inadequate for making inferences about the effectiveness of TA in building capacity.

Engaging in Continuous Quality Improvement (GTO Step 9)

CQI activities can be used to improve a performance gap, as well as to build upon performance excellence. If the outcome evaluation indicates room for improvement (e.g., the delivery system’s general capacity did not improve at the rate expected), performance quality can be improved by revisiting the previous GTO steps (e.g., the initial needs and resources assessment may have missed something important, or the goals and desired outcomes may have been overly ambitious). While there is only minimal literature on CQI in TA, it seems that frequent needs assessments and the use of skills-based capacity-building strategies are both important for improvement.

Addressing Sustainability Issues (GTO Step 10)

Once goals and desired outcomes are accomplished, it is important to sustain the benefits through ongoing evaluation and provision of TA as appropriate. Since the provision of TA is usually time-limited, the capacity built by TA may be more likely to be sustained when the TA provider-recipient relationship allows for openness in communication, shared-decision-making, and general agreement on key programming and evaluation strategies (Butterfoss, 2007). In addition, members of the organization should gradually absorb the training and TA functions previously provided by the Support System (e.g., to support new staff hires).
Quality Improvement/Quality Assurance

To achieve better outcomes in practice, it is important for providers to use best or promising practice strategies. Efficacy and effectiveness studies are used to establish evidence for treatment and prevention strategies and processes. Yet, evidence that a particular strategy or process works in a research trial is not sufficient for achieving outcomes with those strategies in typical practice settings (Shojania & Grimshaw, 2005). We also need evidence about how strategies and processes can be used in a way that actually improves quality and outcomes in practice settings. In this section, we will describe a preliminary framework that was developed to guide the adoption and use of quality improvement/quality assurance (QI/QA) strategies. Through the use of QA strategies, support and delivery providers can identify areas of underperformance; QI strategies are then implemented to move performance to a higher level of quality (Wandersman, 2009).

QI/QA plays important roles in at least two areas of the ISF. First, is the quality of support (e.g., tools, training, and TA) provided by the support system to the delivery system (the area targeted by the EBSIS). The QI/QA section of this article emphasizes the application of QI/QA to implementation by the support system to the delivery system.

Second, is the quality of implementation of the innovation by the delivery system. Meyers, et al, (this issue) provide an expansion of the ISF into implementation and outcomes by the delivery system. QI/QA should also be applied to this implementation by the delivery system, but is not covered in this article.

Brief Review of QI/QA

Industry-derived continuous quality improvement (CQI) approaches – including Lean, Six Sigma, and Plan Do Study Act – are increasingly being used for QI/QA in healthcare settings and are being gradually adopted in other sectors. QA strategies include chart audits, statistical process control and run charts, and failure mode and effects analysis (FMEA). Chart audits are conducted to either gather clients’ baseline and/or outcome data, or to get information about whether a procedure occurred. Statistical process control strategies are used to track and interpret variations in performance over time; they use upper and lower specification limits that
allow for determination of actual change in performance versus random error variance (Ammerman, Putnam, Margolis, & Van Ginkel, 2009). Run charts are identical to statistical process control charts with the exception that they do not report specification limits (Ammerman et al., 2009; Anjard, 1995); run charts document measurements over time and use a line to connect observed values. FMEA is used to forecast potential processes that could result in not meeting standards, and can assess the capacity of the control system to detect the errors (Murugappan & Keeni, 2003).

QI strategies include introduction of checklists, kitting, standardization of a work process, visual management strategies, and work cells. Checklists can have a reminder function to ensure that essential tasks are completed (Gawande, 2009). Reminder or alert systems provide practitioners with prompts to increase the likelihood that they will recall information that is important to a particular setting/task (Shojania & Grimshaw, 2005). Kitting entails providing people with a kit of necessary tools or resources that are needed for a particular task; this prevents wasted time in having to manually gather tools (Rooney & Rooney, 2005).

Standardization of a work process involves developing guidelines (Frutiger, Moreno, Thijs, & Carlet, 1998), or clearly defining a process in terms of how it is to be carried out, including time, sequence, and needed materials (Rooney & Rooney, 2005). Visual management strategies are used to increase the visibility of a work process or structure. This includes the redesign of a workspace – e.g., outlining on a board where certain tools need to go (Motwani, 2003). Work cells are introduced to reduce queues and to improve the flow of production (Ramnath, Elanchezhian, & Kesavan, 2010).

Although the QI/QA literature provides useful information about how practitioners are using QI/QA strategies in their work, the research methods used tend to restrict inferences about the effectiveness of reported QI/QA strategies (e.g., only a small minority of studies use a comparison group or take other steps to improve internal validity). As a result, it is difficult to know if report results were chance fluctuations, a function of extraneous contextual factors, or true change (Speroff & O’Connor, 2004).

An Evidence-based Approach for Quality Improvement/Quality Assurance
In this section, we present a preliminary QI/QA model that outlines a comprehensive programming method for planning, implementing, and evaluating a QI/QA system to monitor and improve performance.

Conducting a Needs/Resource Assessment (GTO Step 1)

A case first needs to be made that performance requires systematic monitoring and improvement. Performance can be related to general organizational functioning, or it may be specific to a particular innovation. Practitioner skills and knowledge testing, client satisfaction surveys, and chart reviews are examples of data sources for determining performance needs (Grol, Bakers, Roberts, & Booth, 1997). For example, Chinman et al. (2003) developed and validated a tool for assessing human capacities among providers treating individuals with serious mental illness.

Tools from the business literature can help to identify root causes of underperformance (needs); examples include a fishbone diagram to map factors that serve as potential sources of defects in quality (Bendell, Penson, & Carr, 1995), and a Pareto chart, which can be used in conjunction with a fishbone diagram to help identify the relative importance of factors contributing to problems in performance (Bendell et al., 1995).

Assessment in Step 1 not only allows for identification of areas of underperformance to improve, but will serve as a criterion in subsequent steps for determining whether performance improvement occurs (Speroff & O’Connor, 2004).

Establishing Goals/Desired Outcomes (GTO Step 2)

Although the specifics will vary by project, QI/QA goals and desired outcomes will generally relate to improvements in performance. Benchmarking – a form of which entails drawing upon a competitor or leader in the field as a criterion for quality performance – is a strategy for selecting specific performance improvement outcomes (Yasin & Zimmerer, 1995). Methods and tools that can be used to facilitate setting of goals and desired outcomes include kaizen events and future state maps. Kaizen events are workshops that are held over five business days to pinpoint goals for improvement (Powell, Rushmer, & Davies, 2009). A future state map is a blueprint that depicts the ideal state of quality, which can help focus a QI/QA initiative and define its target (Lovelle, 2001).
Identifying Best Practices (GTO Step 3).

The QI/QA literature is used to select strategies to meet goals and desired outcomes identified in step 2. For example, when a statistical control chart indicates performance that falls outside of specified control limits, quality improvement strategies are selected based on a review of the best practice literature. Quality improvement strategies may be connected to a particular content area (e.g., coronary bypass surgery) or may be generic. Promising strategies include the use of checklists (Gawande, 2009), as well as industry-based approaches for enhancing workflow, including work cells and a pull system (kanban).

Addressing Issues of Fit (GTO Step 4)

It is important to ensure an appropriate level of fit between QI/QA methods and the surrounding organizational context. For example, QI/QA is more likely to be congruent with organizations that emphasize learning and accountability (Donabedian, 1996). Factors to be considered in this step include the relevance of QI/QA to an organization’s mission, consideration of funder requirements, and fit with preexisting data systems (Sieber, 2008).

Addressing Capacity Issues (GTO Step 5)

There should be sufficient capacities (e.g., human, fiscal, technical resources) in place for implementing QI/QA, including committed facilitators, organizational or administrative support, sufficient training and preparation, and team cohesiveness (Harvey & Kitson, 1996). An important human resource issue involves recruitment of QI/QA team members, which should target individuals at multiple levels of an organization, including high-level managers, supervisors, and service staff (Lammers, Cretin, Gilman, & Calingo, 1996).

Developing a Plan (GTO Step 6)

A QI/QA plan specifies tasks and responsibilities connected to data collection, monitoring, and reporting (Knatterud, Rockhold, George, Barton, Davis, et al., 1998). A charter or opportunity statement may be developed to provide a description of the scope and objectives of quality improvement activities, a timeline, and documentation of the key players (Varkey, Reller, & Resar, 2007). An additional part of planning addresses the selection of validated or
established performance indicators as well as methods for monitoring and evaluating implementation of QI/QA strategies.

**Implementation and Process Evaluation (GTO Step 7)**

Process evaluation (GTO Step 7) monitors implementation of the QI/QA plan (developed in GTO Step 6). Process evaluation can identify potential points of slippage from the QI/QA plan as a basis for initiating mid-course improvements. Metrics for process evaluation include fidelity, dosage, reach, and participant responsiveness (see Durlak & DuPre, 2008). Monitoring methods include use of decision support data systems (Fixsen, Blase, Naom, & Wallace, 2009) or measurement feedback systems (Bickman, 2008).

**Conducting an Outcome Evaluation (GTO Step 8)**

The performance indicators used in Steps 1 and 2 are used again in an outcome evaluation to determine the extent to which the QI/QA goals and desired outcomes were attained. While the specifics will vary by project, outcome evaluations will generically involve determining whether performance has moved back into acceptable limits. Outcome indicators should be routinely tracked to ascertain that a change was connected to implementation of a strategy rather than extraneous factors (Speroff & O’Connor, 2004).

**Engaging in Continuous Quality Improvement (GTO Step 9)**

In this step, staff and other stakeholders review progress achieved through Steps 7 and 8 evaluation data, which includes taking stock of lessons learned through application of the previous GTO steps. Evaluation data and lessons learned from the previous eight steps are used to inform decision-making about specific refinements and/or use of new strategies to enhance QI/QA programming, including planning, implementation, and evaluation.

**Addressing Sustainability Issues (GTO Step 10)**

Current QI/QA programming should be sustained once it has been successful in reaching desired outcomes for performance improvement. Silimperi, Franco, Van Zanten, and Macauley (2002) developed a framework for sustaining a QI/QA system, which highlights the importance of an *internal enabling environment* (which includes policies, leadership, values, and resources),
as well as management functions (QI/QA oversight and coordination) and support functions (training, communication and information, and rewarding quality).

Discussion

Disappointing outcomes reported in evaluation studies continue to remind us that there is not a “magic bullet” for bridging research and practice (Grol & Grimshaw, 2003; Wandersman, 2003; Wandersman, 2009). Barriers to quality implementation of research-based innovations are complex and include: 1) barriers related to the need for research synthesis and the communication (translation) of research findings, and 2) barriers related to the capacity of the practitioners, organizations, or communities to implement new interventions. In the Interactive Systems Framework, an EBSIS can link the ISF systems to overcome these barriers. An EBSIS enhances the communication of research findings to practitioners by virtue of its role in disseminating tools that synthesize and translate research. The EBSIS then builds capacity in the delivery system via training and TA to use tools in ways that promote quality and positive outcomes.

The EBSIS is intended to be systematic, flexible, and collaborative. We have shown that each of the four EBSIS components is designed for accountability by using the GTO framework. In addition, each component is intended to be employed iteratively. Revisions and updates to the components should be anticipated in response to structural and functional changes within and beyond the organization, and with the accumulation of new evidence on what works and what does not.

The EBSIS is a flexible approach. The EBSIS logic model addresses a common challenge to the provision of effective intervention: working in a customized yet consistent fashion with practitioners, organizations, and communities that vary in their initial levels of capacity. Provision of support in the EBSIS is preceded by an assessment of an entity’s capacity and stage of development: the assessment provides information that can be used to tailor appropriate support. Therefore, the EBSIS is expected to resonate with the day-to-day work and attitudes of practitioners and support providers (Aarons, 2006; Addis, Wade, & Hatgis, 1999; Oxman & Flottorp, 2001).
The EBSIS is also a collaborative approach. It provides a shared agenda for funders, practitioners, researcher/evaluators, and consumers to make useful contributions to the research and practice of support. Local organizations and communities, in conjunction with their support providers, can make important contributions to the science and practice of support through participatory action research (Marrow, 1969), use-inspired community research (Chinman et al., 2005), and services research paradigms (Salzer & Bickman, 1997). Consistent with the ISF’s emphasis on integrating research-to-practice models with community-centered (practice-centered) models (Wandersman et al, 2008), we want to encourage funders, researchers, and evaluators to work collaboratively with practitioners, support providers, and consumers to advance and accelerate the research on support. For example, when government agencies fund training and TA and/or develop centers for training and TA, they should do so in a way that uses evidence-based support and promotes evidence-based practice and practice-based evidence on support.

Some Limitations and Next Steps

We present the EBSIS as a frame for accumulating existing work and promoting the science and practice of support. There are many limitations to the EBSIS at this point. They include:

Opportunities to apply the EBSIS in practice are currently constrained by limitations of evidence within each of the four EBSIS components. For example, many of the programming steps for each of the components are either non-existent or weak, especially for TA. There is a need for further conceptualization and theory development across the ten steps of each component. Although promising practices exist within several of the GTO steps, more sophisticated programs of research and methodologies (e.g., studies that include a control or comparison group) are needed to strengthen the evidence-base in each of the ten steps. In our work, we hope to begin to address some of the existing limitations within each support component.

The role and the importance of partnerships in developing an EBSIS must be more clearly articulated including how to bring funders, researchers/evaluators, practitioners, and
consumers together for effective research and practice, and how to use peer-peer learning and communities of practice to build an EBSIS.

Accountability and quality implementation are major priorities in the ISF that span across each of the interacting systems. One of this article’s limitations is that it focuses primarily on the link between the Support System and the Delivery System. A future step will be to additionally illuminate the interaction between the Support System and the Synthesis and Translation System (for example, the development of quality tools may entail mutual contributions by the Support System and the Synthesis and Translation System (e.g., Lewis et al, this issue).

The EBSIS logic model places great importance on initial capacity. A GTO approach to the capacity assessment box is needed.

The EBSOS assumes that adoption has already taken place. More research and practice on the factors that facilitate and inhibit the adoption of an EBSIS are needed.

Leadership is recognized as a key factor in the adoption and implementation of an innovation. The role of leadership needs to be more fully investigated.

**Conclusion**

Billions of dollars are spent on tools, training, technical assistance, and quality improvement/quality assurance activities each year. However, not all tools, training, TA, and QI/QA systems are equally effective in helping to build capacity for implementing innovations. There is a great need to enhance the science and practice of support. In order to be effective, efficient, and accountable, we propose that having an evidence-based system for innovation support is as natural as having evidence-based: health care, therapy or educational programs. In this article, we provide a visualization of what has been developed and what needs to be developed for a quality EBSIS. While we understand that a full scale EBSIS seems daunting, we are clear that it is necessary if we are ever to bridge research and practice. Developing an EBSIS is a journey that was begun in many piecemeal studies and frameworks and now must be brought together in a systematic, accountability framework that is filled in with evidence-based practice and practice-based evidence.
<table>
<thead>
<tr>
<th>Table 1: Key Definitions</th>
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<tbody>
<tr>
<td><strong>Quality</strong></td>
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<td><strong>Standards</strong></td>
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<td><strong>Capacity</strong></td>
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<td><strong>Innovation-specific capacity</strong></td>
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<td><strong>General organizational capacity</strong></td>
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<td><strong>Performance</strong></td>
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Table 2. Ten Steps of the Getting to Outcomes (GTO) Framework

<table>
<thead>
<tr>
<th>Step</th>
<th>Purpose</th>
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</thead>
<tbody>
<tr>
<td>GTO 1: Conduct Needs/Resources Assessment</td>
<td>To identify existing needs and resources</td>
</tr>
<tr>
<td>GTO 2: Establish Goals/Desired Outcomes</td>
<td>To establish goals and desired outcomes (objectives) based on the needs/resource assessment</td>
</tr>
<tr>
<td>GTO 3: Consider Best Practice</td>
<td>To review existing best practices for achieving the established goals/objectives and to select a best practice</td>
</tr>
<tr>
<td>GTO 4: Assess Fit</td>
<td>To ensure that the best practice selected aligns with the needs of the stakeholders</td>
</tr>
<tr>
<td>GTO 5: Address Capacity Issues</td>
<td>To identify existing capacities (e.g., human, financial, technical, intellectual) and address any capacity gaps</td>
</tr>
<tr>
<td>GTO 6: Develop a Plan</td>
<td>To develop a plan for meeting the goals/objectives set forth in GTO Step 2.</td>
</tr>
<tr>
<td>GTO 7: Implementation &amp; Process Evaluation</td>
<td>To implement and monitor implementation of the plans</td>
</tr>
<tr>
<td>GTO 8: Outcome Evaluation</td>
<td>To assess the effectiveness of the innovation</td>
</tr>
<tr>
<td>GTO 9: Continuous Quality Improvement</td>
<td>To make short-term (mid-course) and long-term (strategic) corrections across the stages of a program/innovation</td>
</tr>
<tr>
<td>GTO 10: Address Sustainability Issues</td>
<td>To develop and implement plans for sustaining the program/innovation</td>
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Table 3: An Outline of the Four Components of the Evidence-Based System for Innovation Support

<table>
<thead>
<tr>
<th>Tools</th>
<th>Training</th>
<th>TA</th>
<th>QI/QA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conducting a Needs/Resource Assessment (GTO Step 1)</strong></td>
<td>Examining the current availability of tools; considering the resources available for acquiring or developing a newly needed tool</td>
<td>Clarifying the training needs and resources of the target organization</td>
<td>Determining which aspects of performance require systematic monitoring and improvement.</td>
</tr>
<tr>
<td><strong>Establishing Goals and Desired Outcomes (GTO Step 2)</strong></td>
<td>Determining the broad purpose of a tool and its specific desired outcomes (this step can refer to creation of a new tool or adaptation of a pre-existing tool)</td>
<td>Using needs assessment data to determine the specific aims of training</td>
<td>Setting targets for performance improvement</td>
</tr>
<tr>
<td><strong>Identifying Best Practices (GTO Step 3)</strong></td>
<td>Reviewing best practice guidelines for tool development</td>
<td>Reviewing training literature to identify training programs and instructional strategies</td>
<td>Reviewing TA literature, and potentially other literatures (e.g., consultation), to select best practices for individualized, customized support</td>
</tr>
<tr>
<td><strong>Addressing Issues of Fit (GTO Step 4)</strong></td>
<td>Ensuring that best practices for the tool fit with task-needs, the end-user, and organizational practices and infrastructure</td>
<td>Ensuring that best practices for training are relevant for the trainees and the target organization</td>
<td>Ensuring an appropriate level of fit between QI/QA strategies and the surrounding context</td>
</tr>
<tr>
<td><strong>Considering Capacity Issues (GTO Step 5)</strong></td>
<td>Ensuring that sufficient capacities are in place for specific best practices for a tool (e.g., availability of staff)</td>
<td>Ensuring that sufficient capacities are in place to deliver specific best practices for training.</td>
<td>Ensuring that sufficient capacities are in place for implementing specific QI/QA strategies (e.g., having organizational or administrative support)</td>
</tr>
<tr>
<td>Developing a Plan (GTO Step 6)</td>
<td>Developing a plan for tool implementation that incorporates end-user input</td>
<td>Developing a plan for implementation of training (includes developing and/or collecting training material, training-specific planning)</td>
<td>Developing a plan with action steps for TA, including target end dates, and individuals responsible for action steps</td>
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<tr>
<td>Implementation &amp; Process Evaluation (GTO Step 7)</td>
<td>Rolling out a plan for tool implementation with concurrent monitoring</td>
<td>Delivering the training program, with process evaluation to measure how well activities across the training life-cycle are completed</td>
<td>Implementing the TA plan, with process evaluation to determine the extent to which delivery of TA strategies are on target</td>
</tr>
<tr>
<td>Conducting an Outcome Evaluation (GTO Step 8)</td>
<td>Assessing the extent to which the goals and desired outcomes of the tool are achieved</td>
<td>Determining training effectiveness, or the extent to which training goals and desired outcomes were met</td>
<td>Assessing the extent to which TA goals and desired outcomes have been achieved,</td>
</tr>
<tr>
<td>Engaging in Continuous Quality Improvement (GTO Step 9)</td>
<td>Using strategies to keep a tool current and useful</td>
<td>Making improvements to the training program in order to increase the probability of future training success</td>
<td>Improving TA quality via strategies including frequent needs assessments and the use of skills-based capacity-building strategies</td>
</tr>
<tr>
<td>Addressing Sustainability Issues (GTO Step 10)</td>
<td>If the tool is successful, ensuring that the tool adds value to end-users on a consistent basis</td>
<td>Routinizing, effective training strategies and best practices</td>
<td>Sustaining the benefits of TA through ongoing evaluation and provision of TA as appropriate.</td>
</tr>
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</table>
Figure 1. Relationship between the EBSIS and the ISF
To Achieve Desired Outcomes

Actual Outcomes Achieved

Current Level of Capacity

Innovation

Training

Tool

QA

Figure 2: Evidence-Based Innovation Support System Logic Model
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