

# Brief Overview of the Literature Pertaining to Scale Up

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## System Transformation

Barber, M., & Fullan, M. (2005). Tri-level development: Putting systems thinking into action. *Education Weekly*, 24(25), 34-35.

The authors see little evidence that systems thinking has led to systems action. They call for systems action that is strategic, powerful and pursued in practice. At this time, state level examples of system change are few and far between. Most federal and state policies focus primarily on accountability. They need instead to integrate accountability and capacity-building in a systemic manner. This means changes in the way system leaders conceptualize the problem, formulate corresponding policies and strategies, and allocate resources. The authors note that No Child Left Behind is a classic example of an accountability scheme that as yet has no grounding in the reality of capacity-building.

The longest lever for change is leadership: leadership at all levels; leaders who deliver results and leave behind a legacy of leaders who can go even farther. Leadership standards can help to orient leaders in the right direction and give them individual experiences and development but they suffer from an individualistic bias. The assumption is that if you produce enough individual leaders with the new desired characteristics then the system will change. Not so. Systems quickly blunt or socialize new members. This is why we need to work simultaneously on individual development and system change.

In addition to strengthening qualifications frameworks, systems should ensure that leaders and potential leaders have intensive opportunities to learn in context or on the job, with the help of a mentor or coach. Promote good leadership in all quarters of the system and everyone will be better off.

There is a major trap that system leaders fall into: they assume or are oblivious to whether capacity to implement given policies automatically follows the introduction of supposedly good practice. Here the lesson is don't invest a lot of money up front if the capacity to use it effectively is missing.

The more positive version is to ask critical questions before introducing new policies. What capacities would it take to implement this policy? To what extent do these capacities exist in the system? And how can we promote greater capacity in the course of implementation? The natural bias of policymakers is toward short-term accountability rather than mid or long-term capacity building.

Every new policy then is an occasion to question current capacity and promote greater capacity in the system. So our proposal is to constantly assess capacity and promote it on every occasion. As citizens become increasingly demanding - and rightly so - in what

they expect government to deliver with their money, so it becomes more and more important for governments to maximize the productivity of every dollar or pound they spend. If each investment is designed simultaneously to deliver a specified short or medium-term objective and greater capacity, then the productivity gain is immense. System leaders must focus simultaneously on short term and long term results.

Some new investment is needed upfront, but after that this year's success is next year's new money. The public potentially wants to invest more in education because intuitively people know that better education means more prosperity and well-being for everyone. But all too often, they are not confident that the investment will yield results. The new system thinkers are pleased to enter the quid pro quo world of delivering results in order to secure more resources. They are willing to take the risks, and to make the extra effort on the promise that success breeds success.

The culmination of the previous lessons in action is greater investment toward sustainability. It may not represent largesse in the short run, but the direction will be unmistakable.

Oser, F. (2000). Self-efficacy and the school system. In W. J. Perrig & A. Grob (Eds.), *Control of human behavior, mental processes, and consciousness* (pp. 541-553). Mahwah, NJ: Lawrence Erlbaum Associates.

The author discusses the "tyranny of the status quo" (p 542), defined as the implicit relationships and power structures that make change difficult in any system including the education system. Changing the status quo requires new skills and abilities that typically are not part of current systems. Competence in these new areas requires considerable practice with immediate feedback, access to an expert coach, and experience with success early in the learning process.

Chao, S. (Ed.). (2007). *The state of quality improvement and implementation research: Expert views workshop summary*. Washington, D.C.: Institute of Medicine of the National Academies: The National Academies Press.

Change is difficult, resistant, and often feels wrong. Inducing major change in large organizations is much more difficult than simple behavioral changes because organizations themselves are problematic. Additionally, most organization designs are outdated and do not reflect current environments, requiring more comprehensive organizational change.

There is a process in which change occurs, beginning with collecting data, making a judgment or diagnosis, and deciding on the appropriate change intervention to use. Although the process is known, it is rarely implemented, causing change to be cumbersome and slow. Various definitions are often used for change and include planned change (a process and a technology aimed at improving the health and performance of an organization), organizational development (the continuous application of a single or several techniques focused on improvement), organizational transition (planned change from current state to future state where the future state is reasonably well defined), and organizational transformation (planned change from current state to future state where the future state is emerging and is not clearly defined). All these concepts are becoming increasingly common and better understood in organizational change and system change.

Adelman, H. S., & Taylor, L. (2003). On sustainability of project innovations as systemic change. *Journal of Educational and Psychological Consultation*, 14(1), 1-25.

Too many innovations disappear when project funding ends. Sustainability of these innovations is increased if the innovations and their supports are integrated into the fabric of existing school improvement efforts.

Koeck, C. (1998). Time for organisational development in healthcare organisations. Improving quality for patients means changing the organisation. *British Medical Journal*, 317(7168), 1267-1268.

"A student of management and organization theory could only be stunned by how little the efforts to improve quality have learnt from current thinking in management theory and from the experience of other industries" (p 1267).

Freund, A. M., & Baltes, P. B. (2000). The orchestration of selection, optimization and compensation: An action - theoretical conceptualization of a theory of developmental regulation. In W. J. Perrig & A. Grob (Eds.), *Control of human behavior, mental processes, and consciousness* (pp. 35-58). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Selection, optimization, compensation (SOC) theory conceptualizes the processes of adaptive development for individuals, organizations, and systems. Selection refers to narrowing the range of alternative domains of functioning or goals from the pool of available options. Optimization involves the acquisition and coordination of the means (resources) required for goal attainment. Compensation refers to managing loss or decline in goal-relevant means (resources) through substitution of means or use of external aids.

Selection of goals: Goals provide direction (guide behavior) and focus energy and resources (too many goals = diffused energy). Clear goals direct attention (ward off distractions), mobilize effort (learn skills), increase persistence (commitment to a goal, optimism), and help with strategy development (structures, constraints).

Optimization: A "preactional phase" (the goal is selected but goal-relevant actions have not been taken yet) "consists of planning the implementation of intentions as to how, when, and where to start goal-relevant actions and means." (p 45). Implementation planning specifies means and actions, situations in which to apply those means, and the right timing of actions intended to achieve a goal. An investment of time and energy is needed to acquire and deliberately practice skills to reach a high level of competence. This requires external supervision. External supervision consists of modeling how to do it and shaping on what to do, when to do it, and in what situations to do it. Monitoring progress is key to the process of goal pursuit and helps decide when the process of goal pursuit should be maintained, changed, or stopped. Monitoring involves a continual comparison of the actual and desired state, helps to maintain group cohesion and persistence in the pursuit of longer-term goals, and helps to make the difficult decision to end the pursuit of a particular goal.

"Compensation denotes the application of means in the interest of maintaining a given level of functioning when confronted with a loss in goal-relevant means" (p 49). To

prevent a loss people are more willing to take a risk than in order to achieve a gain. Losses may be due to limitations in means (resources) needed to maintain functioning, due to negative transfer (functional skills in one environment interfere with functioning in the goal-relevant environment), or direct loss of key individuals/ skill sets required for functioning. Compensatory actions might include increasing the time, effort, and energy; acquiring new skills; use of technical aids; seeking assistance from others.

The strategies for optimization and compensation are similar -- the differences lie in the conditions under which they are employed (goal achievement vs. loss aversion). Optimization and compensation are constantly in play - there is no end to it.

Leonard-Barton, D., & Kraus, W. A. (1985). Implementing new technology. *Harvard Business Review*, 6, 102-110.

"New technologies, no matter what their origin, confront managers with a distinctive set of challenges" (p. 102). Most organizations are not willing or able to take on a new technology at the point in its evolution where the developers want to hand it off

- The hand off has to be designed so the developers and implementers work in parallel for a long time
- The purveyors have to integrate the perspectives and needs of the developers and the users

An implementation manager is needed to oversee the use of new technologies in service settings. Researchers and innovators "are much better equipped by education and experience to guide that innovation's development than to manage its implementation" (p. 102).

- Planning that involves the developers and end users and other stakeholders from the beginning
- Analyze product requirements re: how workers interact with it (decisions to be made, work flow), how one part relates to other parts, infrastructure, changes in organizational form or function, staff training, etc.
- Establish an accordion-like framework to guide decisions -- search for information, pause to digest the info, make a decision, then another active period of search in an iterative process as implementation decisions are made, experience is gained, and new problems are encountered (e.g. employ the "usability testing" PDSA cycle)

"The higher the organizational level at which managers define a problem or a need, the greater the probability of successful implementation. At the same time, however, the closer the definition and solution of problems or needs are to end-users, the greater the probability of success. Implementation managers must draw up their internal marketing plans in light of this apparent paradox." (p. 104)

Many implementation efforts fail because someone underestimated the importance of preparation. "The organizational hills are full of managers who believe that an innovation's technical superiority and strategic importance will guarantee acceptance. Therefore, they pour abundant resources into the purchase or development of the technology but very little into its implementation" (p. 103). Implementation managers have to decide whom to approach, when, and with what information to get understanding

and buy in, especially when innovations do not lend themselves to more traditional ways an organization thinks about doing things

- As planning evolves, more individuals and groups need to take ownership of the processes
- Training is essential to the process of handing off new technology
- Opinion leaders are important: they are leaders because they are trusted and credible, not because of some assigned position
- Need a sponsor (top manager with authority who can get resources), a champion (salesperson, diplomat, problem solver), project manager (oversees the details), and integrator (manages conflicting priorities, molds the group via communication skills) -- these are roles, not positions or people

Top management needs to take quick symbolic action in support of the innovation, help managers at all levels send out signals of support (a more difficult task), and then change the organization to accommodate the new technology by incorporating changes in performance measures, incentives, team structures, etc. Have to recognize that the introduction of new technology almost always results in a decline in performance at first. The end result is an organization that is flexible enough to adjust, adapt, and learn continuously.

Nolan, T. W. (2007). *Execution of strategic improvement initiatives to produce system-level results*. Cambridge, MA: Institute for Healthcare Improvement.

Abstract: Quality and safety occupy a prominent place in the strategic plans of many health care organizations. However, a common organizational response to this emphasis on quality and safety is a long list of worthwhile projects and measures that are not well coordinated, let alone capable of achieving system-level results.

The Institute for Healthcare Improvement (IHI) uses a simple mantra to describe the essential elements for strategic improvement: Will, Ideas, and Execution. You have to have the will to improve, you have to have ideas about alternatives to the status quo, and then you have to make it real — execution.

Achieving results at the system or organizational level requires will at all levels, but especially the will of top management to make a new way of working attractive and the status quo uncomfortable. The new system will require new ideas about how work gets done, how relationships are built, and how patients participate in their care. Processes to scan widely within and outside of health care will be needed to find ideas robust enough to form the basis of a new system that performs at unprecedented levels. No single initiative or set of unaligned projects will likely be enough to produce system-level results.

Morgan, G., & Ramirez, R. (1983). Action learning: A holographic metaphor for guiding social change. *Human Relations*, 37, 19-43.

The authors describe organizations and systems as being holographic; that is, each part contains the whole. This means that there are redundancies within parts so that staff can do multiple functions. These multiple skill sets are not always utilized but can be utilized when needed (change in circumstances, unexpected events, crunch times) to assure the continuation of functions that are necessary for the operation of the whole. Thus, the

nature of "the job" at any point in time is defined by the problems facing the whole (thinking, self organizing, adaptive).

The goal is to create systems that "are able to learn from their own experience, and to modify their structure and design to reflect that they have learned." (p. 4). This requires a number of related conditions to exist:

- "Requisite variety" means that the greater the variety in problems faced/ external environments, the more diversity and flexibility must exist in the organization (redundancy, slack, excess capacity, richness, potentiality) and the more staff and organizational elements need to be multi-skilled, interchangeable, and systematically allow for errors arising in other parts of the system. Variety and the ability to act needs to exist at the front lines where the real problems occur in real time.
- Ability for the system to monitor and question the context in which it is operating and to question the rules that underlie its own operation. The system has the capacity to search for errors and faulty operating assumptions, the capacity to learn from them, and the ability to adapt by making needed changes. This sometimes is referred to as double loop learning (do, learn from doing, change, do differently, learn from doing, etc) or learning to learn. Action learning means that we only know about our world insofar as we engage it in some way -- the kind of knowledge gained is connected with the mode of engagement adopted (scientific observation, participant-observer, subject)
- Minimum critical specification. Specify in advance no more than is absolutely necessary ("enabling conditions") for a system to begin operation so that a system can find its own design in double-loop learning fashion.

## **Capacity Development (State Management Group; State Transformation Team)**

Schofield, J. (2004). A Model of Learned Implementation. *Public Administration*, 82(2), 283-308.

“The majority of the literature concerning the implementation of public policy assumes that public managers can carry out new policy initiatives regardless of the behavioral, cognitive or technical demands that the introduction of such policies may make upon them. There has been a tendency to assume that managers actually have the detailed technical knowledge by which to enact such new policies. The paper proposes that ... public managers have to learn a range of often new and detailed techniques in order to implement what are often ambiguous policy directives” (p 283). Learning is constrained by the complexity of the problem, lack of resources, and lack of information and data. Learning is facilitated by organizational structures, project teams, responsive hierarchy; organizational capacity, spare resources; availability and quality of expertise.

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4, 155-169.

Abstract: The search for scientific bases for confronting problems of social policy is bound to fail, because of the nature of these problems. They are "wicked" problems, whereas science has developed to deal with "tame" problems. Policy problems cannot be definitively described. Moreover, in a pluralistic society there is nothing like the undisputable public good; there is no objective definition of equity; policies that respond to social problems cannot be meaningfully correct or false; and it makes no sense to talk

about "optimal solutions" to social problems unless severe qualifications are imposed first. Even worse, there are no "solutions" in the sense of definitive and objective answers.

"The kinds of problems that planners deal with--societal problems--are inherently different from the problems that scientists and perhaps some classes of engineers deal with. Planning problems are inherently wicked.

"As distinguished from problems in the natural sciences, which are definable and separable and may have solutions that are findable, the problems of governmental planning--and especially those of social or policy planning--are ill- defined; and they rely upon elusive political judgment for resolution. (Not "solution." Social problems are never solved. At best they are only re-solved-- over and over again.)

"The problems that scientists and engineers have usually focused upon are mostly "tame" or "benign" ones. As an example, consider a problem of mathematics, such as solving an equation; or the task of an organic chemist in analyzing the structure of some unknown compound; or that of the chessplayer attempting to accomplish checkmate in five moves. For each the mission is clear. It is clear, in turn, whether or not the problems have been solved.

"Wicked problems, in contrast, have neither of these clarifying traits; and they include nearly all public policy issues--whether the question concerns the location of a freeway, the adjustment of a tax rate, the modification of school curricula, or the confrontation of crime." (p 160)

Klein, J. A. (2004). *True change: How outsiders on the inside get things done in organizations*. New York: Jossey-Bass.

Klein observed that to implement change, organizations must build a capacity for it. When this capacity exists, organizations can improve their operations, processes, and, ultimately, their outcomes.

To develop this capacity, organizations often look to external agents, such as management consultants. Klein argues that this approach often fails because these "outsiders" lack complete knowledge of how their clients operate on a day-to-day basis and have difficulty building the trust among employees that is required to implement change. Rather than rely on outsiders, Klein suggests, organizations should cultivate a particular group of insiders that Klein calls "Outsiders on the Inside."

Outsiders on the Inside are employees who wear two hats. One hat is as an employee who understands the internal culture, has credibility within the organization, and can leverage the existing situation. The other hat is as someone who is not blinded by cultural assumptions and who sees mismatches between the root causes of problems and the current solutions applied to them. This person simultaneously sees new approaches to overcoming a challenge while having the ability and support to get these alternative approaches implemented. As an insider, they understand the day-to-day ins and outs of the organization. They care deeply about their organization and want to improve it. Yet while they are comfortable working within the existing culture, they are also able to step back and see where internal assumptions about how work is done are getting in the way

of optimal performance. They are the people who grab new ideas and make them work to help solve problems they face.

Khatri, G. R., & Frieden, T. R. (2002). Rapid DOTS expansion in India. *Bulletin of the World Health Organization*, 80(6), 457-463.

Chen, X. Y., Zhao, F. Z., Duanmu, H. J., Wan, L. Y., Wang, L. X., Du, X., et al. (2002). The DOTS strategy in China: results and lessons after 10 years. *Bulletin of the World Health Organization*, 80(6), 430-436.

DOTS stands for Directly Observed Therapy (or Treatment) System – a system endorsed by the World Health Organization that involves directly observing patients take the full dose of their medicine. From inception in 1998 through 2002, a well-implemented DOTS strategy for tuberculosis (TB) control in India served over 1 million patients, saved over 200,000 lives, and saved over \$400 million. The basic elements of the experience in India were replicated in China.

Those who know the Implementation Drivers will recognize the DOTS as an excellent example of creating a fidelity measurement system ([www.nirn.fpg.unc.edu](http://www.nirn.fpg.unc.edu)).

Ten elements contributing to success of the DOTS program.

- 1) Getting science right and ensuring technical excellence.  
Before embarking on large-scale expansion, all technical policies and detailed training modules for every level of staff were written, extensively revised, field tested over a period of several years, finalized, and disseminated widely.
- 2) Building commitment and ensuring the provision of funds and flexibility in their utilization.  
Government commitment is the engine that drives any health program. Commitment to a public health program waxes and wanes... Starting with a coherent policy basis and effective pilot program, the project gained the support of widening and successive groups of policy holders.
- 3) Maintaining focus and priorities.  
"Only by focus and prioritization can success be achieved."
- 4) Systematically appraising each area before starting service delivery.  
The appraisal process serves as a quality control mechanism for the program by ensuring that each district meets a minimum standard before starting service delivery.
- 5) Ensuring an uninterrupted drug supply.  
Frequent meetings and communication by phone, fax, and email are used to ensure information flow about drug requirements and supply. The recent introduction of computerized monitoring has greatly improved the distribution of drugs.
- 6) Strengthening the established infrastructure and providing support for staff.  
Regular interaction among all levels of staff has led to the creation of a large body of highly skilled, motivated and accountable workers.
- 7) Supporting the infrastructure required in urban areas.  
Staff have been specifically provided to areas lacking an effective healthcare infrastructure. The state and district societies (non-governmental organizations) make decisions on budget formation, hire contractual staff, purchase whatever items are necessary, oversee program planning, implementation and monitoring, and perform other functions.

- 8) Ensuring full-time independent technical support and supervision, particularly during the initial phases of implementation.  
WHO and the Central Tuberculosis Division began hiring, training and deploying doctors to act as consultants.
- 9) Monitoring intensively and giving timely feedback.  
Intensive monitoring and supervision of all aspects of the program at every level has been essential.
- 10) Continuous supervision.  
Supervise, supervise, and supervise. "What gets supervised gets done" (p 461).  
Supervision at all levels is necessary in order to have a successful program.

The capacity building experiences in India and China show that DOTS can achieve high case detection and cure rates even within an inadequate public health infrastructure. However, this can only happen if the delivery program is appropriately designed and effectively managed.

The use of findings from full implementation in early districts led to more effective methods to treat patients and improvements in the intervention. For example, it was found that treatment on an intermittent basis was more effective than daily treatment. Additionally, outcomes were more promising when someone outside the family instead of a family member observed treatment (i.e. the ingestion of the drugs).

Tang, K.-C., Nutbeam, D., Kong, L., Wang, R., & Yan, J. (2005). Building capacity for health promotion - A case study from China. *Health Promotion International*, 20(3), 285-295.

Abstract: During the period 1997-2000 a technical assistance project to build capacity for community-based health promotion was implemented in seven cities and one province in China. The technical assistance project formed part of a much larger World Bank supported program to improve disease prevention capabilities in China, commonly known as Health VII. The technical assistance project was funded by the Australian Agency for International Development. It was designed to develop capacity within the Ministry of Health (MOH) and the cities and province in the management of community-based health promotion projects, as well as supporting institutional development and public health policy reform. There are some relatively unique features of this technical assistance which helped shape its implementation and impact. It sought to provide the Chinese MOH and the cities and province with an introduction to comprehensive health promotion strategies, in contrast to the more limited information, education and communication strategies. The project was provided on a continuing basis over 3 years through a single institution, rather than as a series of ad hoc consultancies by individuals. Teaching and learning processes were developmental, leading progressively to a greater degree of local Chinese input and management to ensure sustainability and maintenance of technical support for the project. Based on this experience, this paper ...describes the education, training and planning activities that were the key inputs to the project, as well as the limited available evidence on the impact of the project. It describes how the project evolved over time to meet the changing needs of the participants, specifically how the content of the project shifted from a risk-factor orientation to a settings-based focus, and the delivery of the project moved from an expert-led approach to a more participatory, problem based learning approach. In terms of impact, marked differences before and after the implementation of the training activities were identified in key areas for reform, in addition to the self reported positive change in knowledge, and a high level of participant satisfaction. Technical assistance projects of this kind benefit from continuity and a high

level of coordination; the provision of culturally and linguistically appropriate teaching; and a clear understanding of the need to match workforce development with organizational/institutional development.

O'Donoghue, J. (2002). Zimbabwe's AIDS action programme for schools. *Evaluation and Program Planning*, 25(4), 387-396.

This article reports on the development and implementation of an HIV/AIDS education program for primary, secondary and college students in Zimbabwe utilizing a curriculum and participatory-based approach. The author concluded that the use of the “top-down” cascade model of training diminished in quality as it moved down through the layers; the time for training and materials development was vastly underestimated; and the ability to be flexible and allow for mid-course corrections is essential to any systems change endeavor.

*Program start up findings:* meetings for stakeholder buy-in to overcome denial about the problem was achieved; funding issues were resolved through a special fundraising initiative; negotiations with the government were unofficial to move things along quicker but this limited widespread understanding and acceptance of the program; teachers' groups were consulted but not other outside groups that may have been helpful to the program over the long run.

*Planning and management findings:* Material development planning was rushed so the writing of the materials began before it was clear what was needed; the material development was very ambitious but the team was able to be flexible in the development and became more realistic as the materials were developed; the project coordinator was able to bolster teamwork which fostered the development of the program.

*Development of materials findings:* Material development for the school classes took much longer than expected (anticipated 3 months but took five years); the authors of the material initially did not have an understanding of participatory teaching which delayed material development and resulted in a high turnover rate for writers; material development was facilitated when an editor/sub-editor was employed with writers working on only one grade; teacher training was adapted to include a focus a teaching sensitive material and participatory teaching methods; the Christian church, not originally included in the development of materials, demanded to be added to the development committee which slowed down material development but allowed for widespread acceptance of the program.

*In-service training and Pre-service training findings:* In-service training utilized the cascade model (where training trickles down; the trainee becomes the trainer for the next level down) through five stages until training reached the teacher; the timing needed to train was greatly underestimated; guidelines were recognized and developed for school cluster trainings; training problems occurred when the participatory teaching was taught in isolation of the curriculum and the cascade model resulted in diminished quality of training as it moved through the various layers down to the teachers. Pre-service training was not linked closely enough to in-service training.

*Evaluation and monitoring findings:* used qualitative and quantitative survey techniques; only one-third of the teachers claimed to use the curriculum as prescribed and only one-third of the teachers indicated they had received training in AIDS education; most

teachers did not understand participatory teaching; initially there was no use of research data in the development of new materials for the program but became more systematic as the program progressed.

Goldman, H. H., Morrissey, J. P., Rosenheck, R. A., Coccozza, J., Blasinsky, M., Randolph, F., et al. (2002). Lessons from the evaluation of the ACCESS Program. *Psychiatric Services*, 53(8), 967-969.

"The study showed that systems integration strategies could be implemented as intended only if significant additional technical assistance was provided. The evaluation also showed that when technical assistance and substantial resources were provided by the federal government, all the sites were able to implement outreach and intensive case management programs that were moderately faithful to the assertive community treatment model. Interestingly, most sites retained these services for one year after the federal resources were withdrawn" (p 967-968)

"The six hypotheses tested in the ACCESS program: Hypothesis (Result)

1. Providing earmarked funds and technical assistance to the nine experimental sites to implement systems integration strategies would result in higher levels of systems integration than at the nine comparison sites (Not supported)
2. Providing earmarked funds and technical assistance to the nine experimental sites to implement systems integration strategies would result in higher levels of project-centered integration than at the nine comparison sites (Supported)
3. Regardless of study condition, sites that more fully implemented the integration strategies would experience higher levels of systems integration and project-centered integration (Supported)
4. Providing earmarked funds and technical assistance to the nine experimental sites would result in greater improvement in client outcomes across the four cohorts than at the nine comparison sites (Not supported)
5. More complete implementation of a greater number of strategies designed to improve systems integration would be associated with superior outcomes (Not supported)
6. Regardless of study condition or the implementation of systems integration strategies, change in the level of system integration across cohorts would be associated with parallel improvement in client outcomes (Not supported)

"The most important lessons are summarized below:

- Systems integration can be improved.
- Important, practical strategies for systems integration can be identified and implemented.
- Implementation of systems integration strategies takes time and requires both technical assistance and resources" (p 968)

Fraser, S. W., & Greenhalgh, T. (2001). Coping with complexity: Educating for capability. *British Medical Journal*, 323(6), 799-803.

Traditional education and training largely focuses on enhancing competence (knowledge, skills, and attitudes). In today's complex world, we must educate not merely for competence, but for capability (the ability to adapt to change, generate new knowledge, and continuously improve performance).

Capability is enhanced through feedback on performance, the challenge of unfamiliar contexts, and the use of non-linear methods such as story telling and small group, problem based learning. Education for capability must focus on process (supporting learners to construct their own learning goals, receive feedback, reflect, and consolidate) and avoid goals with rigid and prescriptive content.

#### **Complexity concepts applicable to education and training**

- Neither the system nor its external environment are, or ever will be, constant
- Individuals within a system are independent and creative decision makers
- Uncertainty and paradox are inherent within the system
- Problems that cannot be solved can nevertheless be “moved forward”
- Effective solutions can emerge from minimum specification
- Small changes can have big effects
- Behavior exhibits patterns (that can be termed “attractors”)
- Change is more easily adopted when it taps into attractor patterns

#### **Process-oriented learning methods: Informal and unplanned learning**

- Experiential learning—shadowing, apprenticeship, rotational attachments
- “Networking” opportunities—during formal conferences and workshops, through open plan poster exhibitions, or extended coffee and lunch breaks, for example
- Learning activities—in structured course materials, such as reflection exercises, suggestions for group discussion
- “Buzz groups” during intervals in lectures—the lecturer invites participants to turn to a neighbour and undertake a short task before the lecture resumes
- Facilitated email list servers for professional interest groups
- Teachback opportunities—newly skilled workers training others in new techniques and sharing their understanding
- Feedback—responses that provide the learner with information on the real or projected outcome of their actions

#### **Process-oriented learning methods: Self directed learning**

- Mentoring—named individuals provide support and guidance to self directed learners
- Peer supported learning groups—the small group process is used for mutual support and problem solving
- Personal learning log—a structured form for identifying and meeting new learning needs as they arise
- Appraisal—a regular, structured review of past progress and future goals
- Flexible course planning that explicitly incorporates input from learners at key stages—using a ‘Post it’ note exercise to add new learning objectives or amend a draft programme, for example
- Modular courses with a high degree of variety and choice

#### **Process-oriented learning methods: Non-linear learning**

- Case based discussions—grand rounds, clinical case presentations, significant event audit
- Simulations—opportunities to practice unfamiliar tasks in unfamiliar contexts by modeling complex situations
- Role play

- Small group, problem based learning (see text for definition)
- Teambuilding exercises—activities focused on the group's emergent performance rather than that of the individual

## **Implementation science and practice (Regional Implementation Teams)**

Fixsen, D. L., Naoom, S. F., Blase, K. A., Friedman, R. M., & Wallace, F. (2005). *Implementation Research: A synthesis of the literature*. Tampa, FL: University of South Florida, Louis de la Parte Florida Mental Health Institute, The National Implementation Research Network (FMHI Publication #231).

The authors summarize the results of an extensive review of components that appear to be common among successful implementation attempts across a wide variety of disciplines, including business and manufacturing as well as education and human services. The common components are arranged into frameworks for implementation: implementation drivers and stages of implementation. In addition, the authors introduce the notion of “purveyors” – implementation teams that have detailed knowledge of an evidence-based intervention and knowledge of effective implementation practices.

Greenhalgh, T., Robert, G., MacFarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: Systematic review and recommendations. *The Milbank Quarterly*, 82(4), 581-629.

The authors report the results of an extensive review of the health care literature regarding diffusion, dissemination, implementation, or routinization of innovations in health care. They summarized the movement of the field from "let it happen" and "help it happen" to "make it happen" styles of implementation. They concluded that a “striking finding of this extensive review was the tiny proportion of empirical studies that acknowledged, let alone explicitly set out to study, the complexities of spreading and sustaining innovation in service organizations” (p. 614). They added that, “herein lies a paradox. Context and "confounders" lie at the very heart of the diffusion, dissemination, and implementation of complex innovations. They are not extraneous to the object of study; they are an integral part of it. The multiple (and often unpredictable) interactions that arise in particular contexts and settings are precisely what determine the success or failure of a dissemination initiative.” (p. 615).

Rogers, E. M. (1995). *Diffusion of Innovations* (4 ed.). New York: The Free Press.

Everett Rogers work on diffusion of information is well known in human services. His studies of how information is communicated and leads to decisions to adopt innovations was initiated in the agriculture field and spread to human services and business environments. Diffusion of information is important for creating awareness of innovations and providing impetus for considering alternatives.

Sullivan, G., Blevins, D., & Kauth, M. (2008). Translating clinical training into practice in complex mental health systems: Toward opening the 'Black Box' of implementation. *Implementation Science*, 3(1), 33.

Implementing clinical training in a complex health care system is challenging. This report describes two successive trainings programs in one Veterans Affairs healthcare network and the lessons we drew from their success and failures. The first training experience led us to appreciate the value of careful implementation planning while the second suggested that use of an external facilitator might be an especially effective implementation

component. We also describe a third training intervention in which we expect to more rigorously test our hypothesis regarding the value of external facilitation.

Our experiences appear to be consonant with the implementation model proposed by the National Implementation Research Network. In this paper we offer a modified version of the National Implementation Research Network model with separate components related to training and implementation. This report further reinforces what others have noted, namely that educational interventions intended to change clinical practice should employ a multilevel approach if patients are to truly benefit from new skills gained by clinicians. We utilize an implementation research model to illustrate how the aims of the second intervention were realized and sustained over the 12-month follow-up period, and to suggest directions for future implementation research. The present report attests to the validity of the emerging literature on implementation research.

## School reform

DiBiase, R. W. (2005). *State involvement in school restructuring under No Child Left Behind in the 2004-05 school year*. Denver, CO: Education Commission of the States.

Thousands of schools have not met the AYP standards for 5 years or more and are required to restructure. The intended beneficiaries are the students in these schools. The onus is on school administrators, school districts, and state education systems to bring about rapid change.

Rowan, B., Barnes, C., & Camburn, E. (2004). Benefiting from Comprehensive School Reform: A Review of Research on CSR Implementation. In C. Cross (Ed.), *Putting the pieces together: Lessons from comprehensive school reform research*. Washington, DC: The National Clearinghouse for Comprehensive School Reform.

"Efforts at comprehensive school reform are time-consuming and difficult, and they proceed with uneven success across schools. However, ...successful school change is possible and depends to a considerable extent on the actions taken by: (a) external providers of design-based, technical assistance; (b) local school personnel; and (c) district personnel who provide support to local school change efforts. In particular, our [work] suggests that the process of CSR will be most successful when external change agents work to produce clear, specific, and high-quality designs for change and provide extensive implementation support to local schools; when local school communities coalesce around the central aims of the research-based model of school reform they are trying to implement and actively learn over a period of years how to utilize that model in their own context; and when district personnel provide a stable and supportive policy environment clearly aligned with the aims of the practices being developed.

"As it turns out, these principles of successful change are not new. In fact, the role of external change agents (like CSR model providers) in stimulating and supporting planned educational change in schools, the centrality of local school personnel to the successful implementation of research-based practices, and the importance of district leadership in promoting successful institutionalization of instructional improvement efforts, have been remarked upon and studied for decades in the voluminous literature on planned educational change in the United States. What is new, however, is that educational researchers, policy makers, and successful education practitioners have begun to arrive at

a more complex understanding of the specific steps that must be taken to assure successful implementation of whole-school change efforts. As a result, there is now a new generation of thinking about how to stimulate and support programs of comprehensive change in schools." (p. 2-3; emphasis added)

Rhim, L. M., Kowal, J. M., Hassel, B. C., & Hassel, E. A. (2007). *School turnarounds: A review of the cross-sector evidence on dramatic organizational improvement*. Lincoln, IL: Public Impact, Academic Development Institute.

"The No Child Left Behind Act of 2001 identifies a series of escalating consequences for schools that fail to demonstrate academic progress measured according to state-specific annual measurable objectives (AMOs). After five consecutive years of inadequate progress, schools are required to restructure by a) converting to a charter school, b) replacing staff relevant to the failure, c) hiring an external contractor to operate the school, d) inviting the state to take over the school, or e) another significant reform that fundamentally changes the school. While the five options reflect specific means for change, they all potentially entail retaining the same students and, at a minimum, some of the staff, but quickly and substantially changing the academic performance of the school." (p 3)

"Yet, while the process of turning around a failing school is fundamental to NCLB, there is a limited literature base documenting successful turnarounds in the education sector. The literature regarding effective school practice is broad and deep, and these practices have been documented to be a core aspect of effective turnaround schools. However, these practices do not provide insight into the process of transforming a chronically failing school into a successful school. In the 2006 Center for Comprehensive School Reform and Improvement publication *Turnarounds with New Leaders and Staff* (Kowal & Hassel, 2006), we synthesized the literature from the education sector and across multiple other sectors – public, nonprofit, and private – related to successful turnarounds. This evidence review is adapted from that publication with substantial updates and new analysis." (p 4)

"For the purposes of our evidence review, we define "turnaround" as a documented, quick, dramatic, and sustained change in the performance of an organization. We define the term in this manner because cross-sector literature uses this term to describe the phenomenon of speedy improvements – from bad to great – typically under new leaders. This forms the most relevant knowledge base for successful restructuring of very low-performing schools. While not necessarily a defining characteristic, turnarounds in other sectors typically entail replacement of the primary leader, but not all staff. Approximately 70% of successful turnarounds in the business sector include changes in top management (Hoffman, 1989).

*Implementing a Turnaround:* "In their study of 166 corporate turnarounds, Sudarsanam and Lai (2001) found that managers of successful turnarounds tended to implement fewer restructuring strategies, but put them in place early in the turnaround process. Failure across sectors is largely associated with well-planned change strategies that are only partially implemented." (p 8) "Common to successful turnarounds is implementation of intense reforms in the first few months. Fast, focused results during the initial year are important in part to help establish credibility, create momentum for change, and break down resistance." (p 8)

*Sustaining a Turnaround:* "Following the initial implementation of turnaround strategies, organizations across sectors frequently enter a longer phase of recovery in which they incorporate changes into sustainable structures. First-stage improvements are likely to be superficial unless they are followed by this longer-term strategy. Pressure that creates a sense of urgency during initial implementation can be useful, but continued time pressure during the recovery phase may cut short the necessary time for lasting changes." (p 9)

*Freedom to Act:* "Schools undertaking significant school reform, for example, appear to have a higher chance of success when the district allows as much freedom as possible from regulations regarding scheduling, transportation, discipline, and curriculum. Case evidence from outside education offers similar findings. In a study of the turnaround at Beth Israel Deaconess Medical Center in Boston, for example, Garvin and Roberto (2005) document the turnaround leader's insistence that the governing board cease to be involved in the day-to-day management of the Center, leaving him free to make necessary changes without their item-by-item permission. Research in the public sector reveals that without an extraordinary leader, lack of freedom to act quickly and decisively can severely hinder an organization's ability to change. Private-sector research indicates that requiring item-by-item permission by a unit for deviations from broader organization policies makes success less likely when the unit is attempting to succeed in an area of previous failure." (p 9)

*Support and Aligned Systems:* "Most organizations in which turnarounds are successful have a supportive governing body that provides assistance to new management while giving the organization freedom to initiate real change." (p 10) "District support may also include changes to align other district "systems" with a turnaround school's needs, which may be critical for sustaining and replicating successful turnarounds within a district." (p 10) "Beyond the district, state education agencies (SEAs) may also play an important support role. SEAs have traditionally been responsible for establishing policy and regulations and collecting data from school districts. Under increasingly high stakes accountability frameworks, SEAs are required to assume a more proactive role in directly supporting district and school improvement (USDOE, 2006)." (pp 10-11)

*Performance Monitoring:* Logically this is a critical feature of any turnaround effort but there is little research to support the role of performance monitoring. "Research suggests that external performance expectations characteristic of current accountability systems alone are insufficient to spur substantial school improvement in many schools (Mintrop & Trujillo, 2005)." (p 12)

*Community Engagement:* "Major restructuring efforts are politically challenging because the benefits of change often do not appear for several years, but the costs are immediate. The key lesson from prior turnaround efforts across sectors is to engage teachers, parents, and the surrounding community in a way that encourages them to become part of the changes in the school, rather than critical observers who watch from the sidelines. The resulting support appears to provide the school with a better chance of success for turning its performance around." (p 13)

*Turnaround Leadership:* The following describes the distinguishing actions and characteristics of school leaders who are very successful in a turnaround situation specifically. Experts who have studied thousands of managers, even when finding common leader characteristics, also have found differences in leaders who perform very well in differing settings (e.g., Boyatzis, 1982; Goleman, 2001; Spencer & Spencer,

1993). Waters et al. (2003) give some attention to this potential distinction, referring to larger, more significant and organization-altering changes within schools as “second-order changes” (p. 7). Based on their metaanalysis of 30 years of leadership studies, they hypothesize that second-order leaders make changes that break with the past, operate outside of existing paradigms, conflict with prevailing values and norms, and are emergent, unbounded, and complex. Waters and his colleagues describe second-order changes as changes that “disturb every element of a system” (p. 7). As detailed below, there are similarities between Waters et al.’s second-order changes and the leader actions described repeatedly in cross-sector literature describing successful turnarounds, including clarifying a vision of the future, involving a leadership team, acknowledging failures openly, challenging the status quo, and acting as the driving force of change.” (p 14)

Vernez, G., Karam, R., Mariano, L. T., & DeMartini, C. (2006). *Evaluating comprehensive school reform models at scale: Focus on implementation.* Santa Monica, CA: RAND Corporation.

“We found that none of the schools in our study had fully implemented all core components of the model they had adopted. We also found broad variations in the level of implementation across schools using the same model. Some core components were implemented more widely than others. For example, schools were generally able to implement the prescribed curriculum of their adopted model, with occasional minor departures to compensate for perceived gaps, such as placing more emphasis on reading comprehension or altering the sequence of topics to meet state or district standards. But schools had more difficulty in following the instructional practices prescribed by their model and in grouping students by level of performance; these two components were generally implemented at a lower level. Finally, in comparison to other core components, practices to increase parental involvement in school affairs were consistently implemented at the lowest level. Overall, the level of implementation did not change with the length of time that a school had been using a model.

“Teachers’ reported commitment to using their schools’ adopted model was typically only lukewarm, notwithstanding the importance model developers place on teacher “buy-in.” The level of teachers’ commitment did not change with years of experience using the model. By contrast, principals consistently overrated their teachers’ commitment to the model. In our case studies, we found that most principals had selected the model themselves, without teacher input. The disparity between principal and teacher perceptions may be the result of teachers having been excluded from the model selection process.

“Model developers typically prescribe a high level of support to ensure that the model is implemented successfully. Such support includes external support (principal and teacher consultation with the model developers/consultants, teacher training, and ongoing professional development) and internal support (the appointment of a school staff member to facilitate and coordinate the implementation). However, most schools did not have the level of implementation support that model developers deemed necessary. On average, teachers received about half of the recommended initial training and about one-quarter of the recommended ongoing professional development. Similarly, both the prescribed levels of external assistance from model developers/consultants and the time allocated to an internal school staff member to facilitate and coordinate model implementation fell short.

“It may be that schools do not have sufficient time or staff to devote to model implementation, or that they lack the flexibility to reallocate their resources, or that they are not motivated to do so. A higher level of support was associated with a higher level of implementation. However, different forms of support were associated with the implementation of different core components. Consistent with previous research, our study shows that the level of teachers’ commitment was associated with implementation of the model’s curriculum, methods of instruction, and grouping of students (all practices that are implemented mostly at the classroom level). The level of teachers’ professional development related to the model was also associated with implementation of curriculum and methods of instruction.

“Implementation of methods of instruction was also associated with the frequency of meetings between teachers and an external consultant; implementation was greater if such meetings occurred more frequently. External assistance from the model developer and internal assistance from the internal facilitator were also associated with schoolwide activities, including grouping of students in classrooms by performance and governance.

“There is significant room to increase the level of implementation of CSR models. We found that the level of support fell short of the level recommended by model developers, and that a higher level of specific types of support was associated with higher implementation of specific model components. Schools should ensure that teachers are committed to implementing the adopted model and that they receive the necessary initial training. Teachers should be more actively involved in choosing the model and in practicing the prescribed changes before they are asked to implement them in the classroom. A higher level of initial and ongoing professional development related to the model may also be needed. Schools that continued use of a model beyond the first few years provided some form of continuing professional development related to the model. To improve implementation of schoolwide changes, the availability of and interactions with an external consultant and an internal consultant may need to be increased as well. Beyond that, it remains to be seen how much more additional support, of what kind, and for what model core component or individual practices may be needed to increase the level of implementation of CSR models. This also is an area where future investigations have the potential to be most fruitful.

“Finally, our findings underline the importance of accounting for the level of implementation when seeking to measure CSR effects on student achievement. Researchers cannot determine whether a CSR model affects student achievement until they first know whether and how completely the model has been implemented.”

Kaiser, R. B., Hogan, R., & Craig, S. B. (2008). Leadership and the fate of organizations. *American Psychologist, 63*(2), 96-110.

This article concerns the real-world importance of leadership for the success or failure of organizations and social institutions. The authors propose conceptualizing leadership and evaluating leaders in terms of the performance of the team or organization for which they are responsible. The authors next offer a taxonomy of the dependent variables used as criteria in leadership studies. A review of research using this taxonomy suggests that the vast empirical literature on leadership may tell us more about the success of individual managerial careers than the success of these people in leading groups, teams, and organizations. The authors then summarize the evidence showing that leaders do indeed

affect the performance of organizations--for better or for worse--and conclude by describing the mechanisms through which they do so.

## **Regional Implementation Teams (Intermediary Organizations)**

Blank, M. J., Brand, B., Deich, S., Kazis, R., Politz, B., Trippe, S., et al. (2003). *Local Intermediary Organizations: Connecting the Dots for Children, Youth, and Families*. Massachusetts: For full text (requires registration): <http://www.jff.org/jff/PDFDocuments/Intermediaries.pdf>.

Despite the conventional wisdom that comprehensive services are an essential element in the support of children and families, over the past several decades programs and services have continued to be disconnected, separately funded, and provided by multiple agencies. The need for intermediary organizations has emerged through the devolution of decision making from the federal to local level, the decentralization of schools and their support networks, and the rise in networking in social services delivery. Intermediary organizations typically carry out activities related to four major functions: (1) engaging, convening, and supporting critical constituencies to increase public involvement, design new initiatives, strengthen local institutions, and achieve tangible results; (2) promoting quality standards and accountability for continuous improvement and to demonstrate positive outcomes; (3) brokering and leveraging resources by increasing the efficiency and impact of service providers and attracting resources that individual organizations often cannot secure on their own; and (4) promoting effective policies that can strengthen local organizations and result in more effective services for young people and families. In order for intermediary organizations to achieve their full potential they need to be: recognized for their value; included in legislation and regulations; funded; and connected to each other.

Honig, M. I. (2004). The new middle management: Intermediary organizations in education policy implementation. *Educational Evaluation and Policy Analysis*, 26(1), 65-87.

Intermediary organizations have become increasingly prominent participants in education policy implementation despite limited knowledge about their distinctive functions and the conditions that constrain and enable those functions. This article describes some of the functions of intermediary organizations by drawing on findings from a comparative case study of four intermediary organizations that helped with collaborative policy implementation in Oakland, California. Intermediary organizations are defined as organizations that operate between policymakers and end users to affect changes in roles and practices for both parties. Oakland's intermediary organizations all provided new implementation resources – knowledge, political/social ties, and an administrative infrastructure – but faced different constraining and enabling conditions. Intermediary organizations are important participants in contemporary policy implementation.

Dunst, C. J., Trivette, C. M., Masiello, T., & McInerney, M. (2006). Scaling up early childhood intervention literacy learning practices. *Cell Papers*, 1(2).

"The primary means to scaling up targeted practices will be state, regional, and local resource teams. The resource teams will include stakeholders and key players at different levels throughout a state. Specialized technical assistance will be provided to the resource teams to build their capacity, who, in turn, will build the capacity of end users to adopt

and use CELL early literacy learning practices. Scaling-up will occur through replications of replications to produce spread (scaling-out) in ways that the practices and their consequences (outcomes) are “recreated repeatedly” in an iterative manner.

"Capacity building will be directed toward organizational policies, practices, and implementation strategies consistent with ...scaling-up." (p 3)

Stetler, C. B., Legro, M. W., Rycroft-Malone, J., Bowman, C., Curran, G., Guihan, M., et al. (2006). Role of "external facilitation" in implementation of research findings: a qualitative evaluation of facilitation experiences in the Veterans Health Administration. *Implementation Science, 1*(23).

Findings suggest that facilitation, within an implementation study initiated by a central change agency, is a deliberate and valued process of interactive problem solving and support that occurs in the context of a recognized need for improvement and a supportive interpersonal relationship. Facilitation was described primarily as a distinct role with a number of potentially crucial behaviors and activities. Data further suggest that external facilitators were likely to use or integrate other implementation interventions, while performing this problem-solving and supportive role.

Harvey, G. (2002). Getting evidence into practice: the role and function of facilitation. *Journal of Advanced Nursing, 37*(6), 577-588.

Facilitation can be represented as a set of continua, with purpose of facilitation ranging from task-focused activity to a more holistic process of enabling individuals. Defining characteristics of facilitation that distinguish it from other change agents are:

- It is an appointed role as opposed to that of an opinion leader who through their own personal reputation and experience acts as a change agent
- The role may be internal or external (or combined) to the organization in which the change is being implemented
- The role is about helping and enabling rather than telling and persuading
- Within the concept of helping/enabling, the focus of facilitation can encompass a broad spectrum
- Given the broad focus of facilitation concept, a wide range of facilitator roles are possible with corresponding skills and attributes needed to fulfill that role.

Simmons, D. C., Kuykendall, K., King, K., Cornachione, C., & Kame'enui, E. J. (2000). Implementation of a schoolwide reading improvement model: "No one ever told us it would be this hard!" *Learning Disabilities Research & Practice, 15*(2), 92-100.

30 years of research on reading with no real benefits to students or society. A school wide model for reading improvement in the primary grades of 2 schools was studied. Others have identified problems of getting research into practice in schools: gross underestimation of the time and effort needed to make changes, a top-down researcher driven approach, lack of teacher involvement in all stages, lack of useful translations of the research for practitioners. They developed a program at the school building level, were guided by the scientific evidence, customize the program to fit for each school, tethered it to a centralized data management systems for decision making, and developed processes for the long run.

Lessons learned re: implementation are:

- Requires a well designed program and staff development, feedback, and ongoing coaching -- teachers either got on board or left for other schools
- Requires resources for purchasing materials, training, consultation, technology
- Requires student performance data to inform decision making and to design instructional adjustments
- Requires focus and leadership -- principals participated fully in all phases, were tenacious, and found the "few good persons" on the staff who could lead the effort from within and with enthusiasm

## High Fidelity Implementation Yields Better Results

Woolf, S., & Johnson, R. (2005). The break-even point: when medical advances are less important than improving the fidelity with which they are delivered. *Annals of Family Medicine*, 3, 545-552.

Abstract: Society invests billions of dollars in the development of new drugs and technologies but comparatively little in the fidelity of health care, that is, improving systems to ensure the delivery of care to all patients in need. Using mathematical arguments and a nomogram, we demonstrate that technological advances must yield dramatic, often unrealistic increases in efficacy to do more good than could be accomplished by improving fidelity. In 2 examples (the development of anti-platelet agents and statins), we show that enhanced efficacy failed to achieve the health gains that would have occurred by delivering older agents to all eligible patients. Society's huge investment in technological innovations that only modestly improve efficacy, by consuming resources needed for improved delivery of care, may cost more lives than it saves. The misalignment of priorities is driven partly by the commercial interests of industry and by the public's appetite for technological breakthroughs, but health outcomes ultimately suffer. Health, economic, and moral arguments make the case for spending less on technological advances and more on improving systems for delivering care.

Aladjem, D. K., & Borman, K. M. (2006, April). *Summary of Findings from the National Longitudinal Evaluation of Comprehensive School Reform*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

"Comprehensive school reform (CSR) is only as effective as its implementation." Only about 20% of the schools implemented CSR comprehensively in 2002 and by 2004 the number dropped to only 10% of the schools. Agents (principals, teachers, purveyors) are key to successful, sustained implementation. Success for All (SFA) school-wide implementations were more successful for longer times. Student achievement (math and reading) improved in CSR schools that fully implemented the CSR with fidelity and sustained the CSR over time (biggest achievement gains were noted for years 3 – 5).

Paulsell, D., Kisker, E. E., Love, J. M., & Raikes, H. H. (2002). Understanding implementation in Early Head Start programs: Implications for policy and practice. *Infant Mental Health Journal*, 23(1-2), 14-35.

In 1997, after about 1 year of operation, 6 of the 17 Early Head Start programs reached full implementation. In 1999, after 3 years 12 of the 17 had reached full implementation.

Biggest improvements were in community partnerships (from 8 to 15) and management systems and procedures (from 7 to 14). Least implemented were child development (from 8 to 9) and family partnership (from 9 to 12) areas. Early implementers started with a strong child development focus, had low staff turnover, and consistent leadership. Later implementers responded promptly to feedback from early site reviews, shifted from family support to a child development focus, and had early changes in leadership. Incomplete implementers had trouble responding to feedback from site visits, had trouble shifting to a child development focus, had higher staff turnover, had turnover in leadership, and difficulties in community partnerships.

Felner, R. D., Favazza, A., Shim, M., Brand, S., Gu, K., & Noonan, N. (2001). Whole school improvement and restructuring as prevention and promotion - Lessons from STEP and the project on high performance learning communities. *Journal of School Psychology, 39*(2), 177-202.

Clear declines in drop out rates in high school, across multiple trials, of 40-50% or more. More likely to avoid drops in academic performance and achievement levels. Lower levels of behavioral difficulties. Greater the risk greater the benefits. Compared STEP to individual skill-building programs and showed better results for STEP, perhaps in part because these individual skill-building interventions were not implemented effectively or at all. Poor implementation led to weaker results.

Gottfredson, D. C., & Gottfredson, G. D. (2002). Quality of school-based prevention programs: Results from a national survey. *Journal of Research in Crime and Delinquency, 39*(1), 3-35.

A national probability sample of 3,691 school-based prevention activities operating in the spring of 1998 is used to describe the quality of implementation of typical school-based prevention practices, compare the quality of implementation of prevention practice with what is typical in prevention research, and test hypotheses about predictors of the quality of implementation. Results indicate that the quality of school-based prevention practices as they are implemented in the typical school is low. The examination of correlates of prevention quality suggests that the level of implementation of prevention practices can be improved through better integration of these activities into normal school operations; more extensive local planning and involvement in decisions about what to implement, greater organizational support in the form of high-quality training, coaching, and principal support, and greater standardization of program materials and methods.

Schacter, J., & Thum, Y. M. (2005). TAPping into high quality teachers: Preliminary results from the teacher advancement program comprehensive school reform. *School Effectiveness and School Improvement, 16*(3), 327-353.

Our preliminary results suggest that TAP schools' achievement grew significantly (E.S. = .35 and .41 for 2001 and 2002, respectively) more than controls. However, the magnitude of the achievement gains varied by school and fidelity of implementation.

Tivnan, T., & Hemphill, L. (2005). Comparing four literacy reform models in high-poverty schools: Patterns of first-grade achievement. *Elementary School Journal, 105*(5), 419-441.

Sixteen high-poverty schools that had made at least "good" efforts in implementing their chosen reform model were the focus of the investigation (i.e. all the schools were implementing the models with a reasonable degree of fidelity). Literacy achievement for 590 children was assessed in fall and spring of first grade, including assessments of word reading, phonemic awareness, vocabulary, reading comprehension, and writing. The models adopted in the district (Building Essential Literacy, Developing Literacy First, Literacy Collaborative, and Success for All) produced similarly strong outcomes in first-grade word reading despite philosophical and practical differences in the models.

Penuel, W. R., & Means, B. (2004). Implementation variation and fidelity in an inquiry science program: Analysis of GLOBE data reporting patterns. *Journal of Research in Science Teaching*, 41(3), 294-315.

Higher fidelity implementation leads to greater achievement in science too.

Horner, R. H., Todd, A. W., Lewis-Palmer, T., Irvin, L. K., Sugai, G., & Boland, J. B. (2004). The School-wide Evaluation Tool (SET): A Research Instrument for Assessing School-wide Positive Behavior Support. *Journal of Positive Behavior Interventions*, 6(1), 3-12.

For School-Wide Positive Behavior Support, higher fidelity is associated with better outcomes for students.

Greenberg, M. T. (2000). The Study of Implementation: Current Findings from Effective Programs that Prevent Mental Disorders in School-Aged Children. *Journal of Educational and Psychological Consultation*, 11(2), 193-221.

Abstract: Prevention science is a rapidly advancing field and is at the point where a number of preventive interventions have documented the ability to change developmental trajectories and reduce negative outcomes. Recently, reports summarizing these "effective" programs have circulated among researchers and practitioners. Surprisingly, many of the highest-quality programs fail to take adequate steps to monitor and verify program integrity. This weakens the conclusions that can be drawn regarding the program outcomes and reduces the likelihood that replications will resemble the original program. The next challenge facing the prevention field is to help consumers who are implementing effective programs in naturalistic settings do so with quality and fidelity to the original program so that they achieve similarly successful outcomes.

McBride, N., Farrington, F., & Midford, R. (2002). Implementing a school drug education programme: reflections on fidelity. *International Journal of Health Promotion and Education*, 40(2), 40-50.

The School Health and Alcohol Harm Reduction Project (SHAHRP), a longitudinal research study incorporating a series of lessons, is used to illustrate fidelity issues. The various methods adopted to optimise and measure the fidelity of SHAHRP implementation served several purposes: teacher training assisted in skilling and informing teachers about the importance of fidelity rigor; teacher self-report data documented the extent of completion for each activity; assessment of selected activities in student workbooks provided quantitative information about fidelity; and student self-assessment and in-depth interviews with teachers provided insight into teachers' and students' level of involvement in SHAHRP.

## Innovation Zones

Amidon, D. M. (2006). *Knowledge innovation zone*. Retrieved January 14, 2008, from <http://www.inthekzone.com/KIZone-declaration.htm>

"A Knowledge Innovation Zone (KIZ) is a geographic region, product/service/industry segment or community of practice (e.g., with topical areas of interest) where knowledge flows from the point of origin to the point of need or opportunity. These zones are emerging in the quest for sustainable growth and economic development for cities, regions, countries, enterprises and global virtual communities."

Nord, W. R., & Tucker, S. (1987). *Implementing routine and radical innovations*. Lexington, MA: D. C. Heath and Company.

The authors carefully examined factors influencing implementation of innovations in banks and savings and loan institutions. The authors described how complex institutional arrangements often must be dismantled before new ideas can be nourished. Support for effective implementation of an innovation requires the creation of a new unit (innovation zone) in which new personnel are recruited and which has its own source of resources and enough time to work through the implementation stage. New personnel need to be recruited based on their commitment to the innovation.

The lack of technical readiness was self-perpetuating. Organizations lacking technical readiness were unable to recognize these inadequacies. Managers did not know what questions to ask, how to ask them, and whom to ask. In addition, the technical people in the organization lacked the ability to recognize what the requirements would be. It seemed to take a crisis to produce a corrective response.

They found that "parallel structures" were important; innovation zones where a formally sanctioned temporary organization could be created and exist side by side with the existing formal organization. The organization that is formed in the innovation zone has delegated "power, freedom from the normal written rules and procedures of the formal organization, and simplicity." This is needed so "fledgling ideas are not crushed by the established routines."

Implementation often requires more than creativity, motivation, and focus. It demands new skills and behaviors of individuals and new means of coordination. They were surprised to find that importing expertise (use of skilled purveyors) made a huge difference that over rode many of the expected influences of org. structure, climate, staff competencies, etc. In essence, importing and contracting out can reduce the effects of previous history and thereby greatly diminish the relationships between structure and task demands that structural contingency approaches lead us to expect.

## Usability Testing

Allen, B. L. (1996). *Information tasks: Toward a user-centered approach to information systems*. New York: Academic Press.

Brown, B. S. (1995). Reducing impediments to technology transfer in drug abuse programming. In *Reviewing the behavioral science knowledge base on technology transfer* (Vol. 155, pp. 169-185). Rockville, MD: U.S. Department of Health and Human Services, National Institutes on Health, National Institute on Drug Abuse.

Frick, T., Elder, M., Hebb, C., Wang, Y., & Yoon, S. (2006). *Adaptive usability evaluation of complex web sites: How many tasks?* Unpublished manuscript, Indiana University, W.W. Wright Education 2276, 201 N. Rose Ave., Bloomington, IN 47405-1006.

Genov, A. (2005). Iterative usability testing as continuous feedback: A control systems perspective. *Journal of Usability Studies*, 1(1), 18-27.

Nielsen, J. (2000). *Why You Only Need to Test With 5 Users*. Retrieved April 22, 2007, from <http://www.useit.com/alertbox/20000319.html>

Nielsen, J. (2005). Usability for the masses. *Journal of Usability Studies*, 1(1), 2-3.

Rubin, J. (1994). *Handbook of usability testing: How to plan, design, and conduct effective tests*. New York: John Wiley & Sons.

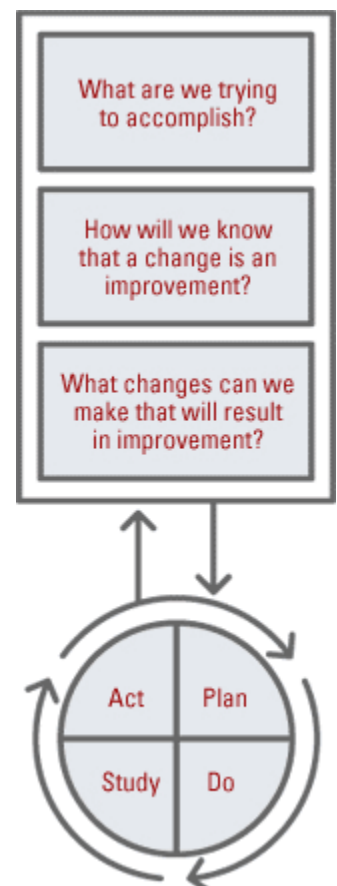
**Usability testing strategies.** McGrew, Bond, Dietzen, and Salyers (1994) caution that (a) most program models are not well defined conceptually, making it difficult to identify core intervention components; (b) when core intervention components have been identified, they are not operationally defined with agreed-upon criteria for implementation; and (c) only a few models have been around long enough to study planned and unplanned variations. Thus, the usability testing methods outlined in this section will be used by the state transformation teams and regional implementation teams to establish the core intervention components of less well-defined evidence-based programs and other innovations.

The “usability criteria” for core intervention components are:

- Clear description of the intended intervention: What will be done, by whom, when?
- Practical measure of fidelity: What will be used to verify that “it” is being done?
- Fully operationalized: What do teachers and staff need to do and say when they are doing “it?” How teachable is the program to teachers and staff?
- Contextualized: How does the innovation fit into existing organizational (school, district, state, federal) structures and functions? What must change to support the use and effectiveness of the innovation?
- Effective: Is implementing the innovation “worth it?” Are the effect sizes for evidence-based programs large enough to warrant all this effort? Are the innovations in organizational management or measurement important enough to warrant expending the resources required for effective implementation and scale-up?
- Field tested: What are the results of “usability testing” with typical users in typical education settings?

Answers to these questions often are the product of usability testing. The core intervention components are, by definition, essential to achieving good outcomes for students. Thus, operationalizing the innovation and specifying the core intervention components becomes very important to the process of scaling up innovations.

Usability testing makes use of *the plan, do, study, act (PDSA) cycle* that is at the heart of process engineering (Deming, 1986). The PDSA cycle is a commonly used approach for rapid-cycle improvement across many domains including, for example, manufacturing (Shewhart, 1931), health (Langley et al., 1996), medication access and adherence (Varkey et al., 2007), and substance abuse treatment (McCarty et al., 2007). This method involves a “trial-and-learning” approach in which an innovation is carried out on a small



scale before any changes are made to the whole system. The usability testing (PDSA cycle) is played out in an “*innovation zone*.” An innovation zone is a smaller, representative portion of the whole that provides enough breadth to ensure a good test of an innovation while limiting the damage of mistakes and wrong turns that surely will occur in such complex environments.

The PDSA steps are conducted over iterative cycles designed to discover and solve problems, which eventually leads to exponential improvements. In the *plan phase*, the best available information about the innovation is detailed, tasks are assigned, and measures of improvement are selected. This phase is the starting point for assuring that an innovation is “clearly described” and “operationalized.” In the *do phase*, the innovation is put into use and any deviation from the plan is documented. In industry, these deviations are called defects. In human services we are more likely to describe these deviations as low fidelity. This phase is the starting point for developing a “practical measure of fidelity.” The deviations from the plan are then analyzed in the *study phase*. The results from the test cycle are examined, and questions are asked regarding what went right, what went wrong, and what will be changed in the next test cycle. This phase is the starting point for “contextualizing” the innovation. In the *act phase*, lessons learned from the study phase are incorporated into a new definition of the innovation, and a new PDSA cycle is initiated. The PDSA cycle of trial-and-learning is the heart of field testing, and is a core component of Schofield’s (2004) recommendation for “learned implementation” in the public sector to increase the competence and capabilities of managers as they develop solutions, try them out, modify them via feedback and evaluation, begin to routinize them, and finally operationalize the policy implementation.

Much has been made in the Human Factors / Usability community in the last decade about the proper number of users needed to perform a usability test. Much of the research in the 1990’s suggested that five participants will yield 80-85 percent of the findings in a usability test. Starting from a task analysis perspective, Dumas and Redish first suggested identifying user profiles and then selecting subgroups that will need to be tested. Characteristics that are important for those subgroups are then defined and the most critical characteristics in participants are selected for testing. These are used to determine the range of participants, which then has an impact upon how many participants need to be selected for usability testing. Rubin noted that it is often inappropriate or impossible to use classical experimental design procedures to conduct usability tests in the fast paced development environment. Rubin supports the Virzi and Nielsen testing recommendations, but takes it one step further – recommending four participants per treatment group."