Report on the National Invitational Conference

*Conceptualizing Scale-Up: Multidisciplinary Perspectives*

Washington, DC, November 3-4, 2003

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History and Purpose of the Conference

The Data Research and Development Center (DRDC) is a research and technical center established in 2002 as part of the U.S. Federal Government's Interagency Education Research Initiative (IERI). The purpose of the DRDC is to work to understand the factors that are essential for scaling-up promising educational models, programs, and strategies. As a technical center, the DRDC works to identify—and develop plans to address—the methodological and other challenges that arise when conducting research on scale-up. In addition, DRDC staff work with IERI investigators to build capacity by strengthening the community of scholars studying scale-up and sharing their findings with practitioners and policymakers.

Building a Science of Scale-Up

One of the goals of the DRDC is to undertake a research agenda directed at building a science of scale-up. A priority Year 1 activity for center staff and research associates was an examination of the scientific literature on scale-up, focusing specifically on: (1) published and unpublished materials from current IERI projects; (2) reports on interventions, including ones that center on education as well as those that deal with social issues but have educational implications; and (3) scholarly work on scale-up in disciplinary fields outside of education (e.g., chemistry, engineering, health, and manufacturing).

The latter was particularly important; researchers in many fields outside of education tackle issues of scale-up, but the literatures from these fields had not been reviewed, compared, and contrasted. In reviewing this literature, we found that while some have already developed informal and formal theories of scale-up that apply to their particular fields, different disciplines...
frequently addresses issues of scale-up in different ways.\textsuperscript{1} As our reviews progressed, it became increasingly clear that researchers working with promising educational interventions would benefit from interactions with individuals outside of education who are also using principles of scale-up in their work. However, it was not clear how easily this objective could be accomplished using the existing scholarly channels of communication, or current interdisciplinary opportunities.

While reviewing the scale-up literature, DRDC was also conducting a needs assessment to identify the technical assistance requirements of the IERI community and to guide outreach efforts. Having found that different disciplines frequently address issues of scale-up in different ways, we expected IERI investigators would themselves have different understandings—reflective of the different disciplines in which they were trained—of what it means to take a project to scale. For this reason, DRDC felt it important to understand the similarities and differences in researchers’ conceptualizations of scale-up. This influenced DRDC’s decision, in consultation with IERI program staff, to include researchers’ conceptions of scale-up as one of the three major themes around which the needs assessment protocol was structured. Initial analyses of transcripts of in-depth personal needs assessment interviews with over 50 investigators representing 45 IERI projects supported our expectation. While all of those interviewed spoke about scale-up in terms of ‘size’ and obtaining greater impact from exemplary interventions, they articulated several different conceptualizations of scale-up. The early findings from this ‘snapshot’ of 57 IERI projects that were active from November 2002 through June 2003 suggested IERI investigators would benefit from additional opportunities to

\textsuperscript{1} See, e.g., Blumenfield et al., 2000; Brooks, 1995; Datnow et al., 1998; Flamholtz, 1990; Hopp and Spearman, 2001; Nunnery, 1998; Schafer, 2001; Smith et al., 1998; Taylor, Nelson, and Adelman, 1999; Uvin and Miller, 1996; Uvin, Jain, and Brown, 2000; Watts and Kumaranayake, 1999; Zlokarnik, 2002
engage with each other to identify the implications of their conceptions of scale-up for educational research, capacity building, and related activities.\(^2\)

One way to advance communication among disciplinary fields would be to host an invitational conference that specifically addresses how scale-up is conceptualized, modeled, and evaluated in education and other areas. Conference presenters would be asked to comment on the knowledge and experiences developed in fields that routinely apply production models (e.g., in scaling up from prototype to production). The focus for each presenter would be the models they employ and the analytic techniques and practical matters they consider when scaling-up a product or service, not the innovation itself. Discussants would be drawn from the ranks of IERI and other education research traditions to draw out and highlight themes of particular interest to IERI research and program objectives. Such a format would help ensure the information presented would be constructive and meaningful to the participants.

In addition to these interdisciplinary presentations, it was decided to hold a second series of sessions organized around education themes of particular interest to IERI researchers. This would provide an opportunity for participants to compare and contrast informally the different traditions across disciplines, further highlighting common themes and disparities that might usefully be incorporated in a multidisciplinary conceptualization of scale-up. These education sessions would simultaneously provide an opportunity for IERI researchers to consider

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\(^2\) For example, IERI researchers' conceptions of scale-up: (1) affected the types of technical assistance investigators requested in the needs assessment interview; (2) affect the magnitude and nature of their interest in community building, including resource sharing; (3) foster interest in making the IERI community a permeable one (e.g., through speaking with administrators about the importance and challenges of conducting scientific research on scale-up in schools); (4) identify a commitment to establishing when interventions have the scientific claims and warrants to merit implementation outside the (more or less controlled) pilot program environment; and (5) emphasize how scale-up research can bridge the gap between exemplary scientific inquiry and effective educational practice. For a full report of the findings of the Year 1 DRDC needs assessment for IERI scale-up research projects, see Data Research and Development Center (2004).
systematically theoretical and methodological issues they rarely have an opportunity to explore collectively outside the forum of annual principal investigator (PI) meetings.

A Learning Access Grid Experiment

Another goal for the conference was to unite the geographically and substantively diverse group of researchers in the IERI community around the issue which unites them: the challenge of how to scale-up exemplary educational interventions. Increasingly interdisciplinary research in education occurs in multiple sites; for example, two major IERI programs each involve collaboration across three separate institutions. Grid technology facilitates this type of work, using “advanced distributed computing technologies . . . to connect groups of people within virtual room environments” (inSORS, 2004). NSF is currently the major supporter of grid technology, and many IERI projects are located at universities which support this technology. At the present time, however, the capabilities of grid technology remain relatively untapped by the social science research community. DRDC believes grid technology could be a valuable tool for enhancing collaboration across projects and plans to explore the potential of grid technology within the IERI research community. This is consistent with our goal of fostering community building and collaboration within the IERI research community. It is also an integral component of an associated research agenda on the sociology of knowledge and the factors (chief among them, trust) that facilitate data sharing among education researchers. Inviting a small number of IERI researchers to participate in the
conference via Access Grid™ (AG)\textsuperscript{3} technology would provide an opportunity to expose our community to and gauge their interest in this technology.

**Program**

DRDC organized and hosted *Conceptualizing Scale-Up: Multidisciplinary Perspectives*, November 3-4, 2003 at the Park Hyatt Washington Hotel in Washington, DC. In keeping with the dual objectives of the conference, the program was designed to balance exploration of scale-up in disciplines outside education with reports on lessons learned from extant IERI research regarding the methodological, practical, and analytical challenges of conducting scientific research to develop and scale up exemplary educational interventions in varied school settings with diverse student populations. DRDC identified four major themes for the conference: (1) conceptual, theoretical, and analytic perspectives for scale-up; (2) measuring for scale-up; (3) challenges of scaling up promising interventions; and (4) the results of scale-up initiatives. Seven core questions were developed from these themes for members of the conference program to address in their presentations and remarks:

- What are the prevailing conceptualizations of scale-up in social science research today?
- What models have the most potential for transference to the scale-up of educational interventions?

\textsuperscript{3} The Access Grid™ is “an ensemble of resources including multimedia large-format displays, presentation and interactive environments, and interfaces to Grid middleware and to visualization environments. These resources are used to support group-to-group interactions across the Grid” (see Access Grid Project, 2004).
• How do the features that characterize and distinguish conceptualizations of scale-up affect the selection of appropriate research designs to assess intervention effects?

• To what extent does scale affect the identification of patterns?

• What approaches are particularly effective in generalizing theoretical propositions about phenomenon at one level of an organization or system to other levels?

• What design components, benchmarks, or pre-existing conditions should be considered before bringing an intervention to scale?

• Which factors are emerging as major impediments to achieving sustainable results when exemplary interventions are scaled up from prototype or pilot to a wider context?

DRDC developed from these core questions tailored sets of questions for seven sessions, three exploring scale-up outside and four within the educational research context. These seven invited paper sessions were bracketed by introductions from representatives of each of the three IERI funding agencies, and concluding remarks. A guest speaker was also invited to address a conference dinner on the cross-cutting theme of the potential of computer-centered networks and technologies to facilitate collaboration (e.g., to take ideas from inception to realization) and transform social relations across multiple domains. Detailed descriptions of the content and organization of the conference sessions follow.

**Agenda**

Three senior federal officials opened the conference in an introductory session chaired by IERI Program Officer Janice Earle of the National Science Foundation: Duane F. Alexander, Director of the National Institute of Child Health and Human Development at the National Institutes of Health; Judith A. Ramaley, Assistant Director, Education and Human
Resources Directorate, National Science Foundation; and Grover J. (Russ) Whitehurst, Director of the Institute of Education Sciences at the U.S. Department of Education. Seven paper sessions considered separately conceptualizations, challenges, and approaches to measuring scale-up and the practical challenges encountered in implementing scale-up initiatives (see Table 1).

**Table 1. Invited Paper Sessions**

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<th>Session Title</th>
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<tr>
<td>Theoretical and Analytic Models for Scale-Up: An Educational Perspective</td>
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<tr>
<td>Theories and Models from the Social Sciences</td>
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<tr>
<td>Scaling Up from Prototype to Production</td>
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<tr>
<td>Scaling Up Promising Educational Interventions</td>
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<td>Measurement Models for Scale-Up</td>
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<td>Measuring for Scale-Up in Education</td>
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<td>Challenges of Scale-Up: Notes from the Field</td>
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Speakers in the first paper session, “Theoretical and Analytic Models for Scale-Up: An Educational Perspective,” were asked to address the following issues in their presentations:

- What are the prevailing conceptualizations of scale-up in education research today?
• What specific design components, benchmarks, and pre-existing conditions should be considered before bringing an intervention to scale?

• How have education researchers’ conceptualizations of scale-up been shaped by experiences, questions, and models from other disciplines?

Larry V. Hedges (University of Chicago) discussed “Scaling Up in Education as a Scientific Research Problem.” David K. Cohen (University of Michigan) explored “Educational Innovation and the Problem of Scale.” Mark A. Constas (Cornell University, formerly IERI program officer at the Institute of Education Sciences, U.S. Department of Education) discussed the papers; James A. Griffin (Assistant Director for the Social, Behavioral, and Education Sciences in the Science Division of the U.S. Office of Science and Technology Policy) chaired the session.

The second paper session explored “Theories and Models from the Social Sciences.”

DRDC commissioned three papers in this session, to consider questions such as:

• How have economists typically conceived the problem of how intervention effects change with scale?

• What are the most common models of scale-up in business and economics?

• What are the most valuable experiences, perspectives, and craft knowledge that have come from research on efforts to scale up model programs or exemplary interventions in these fields?

• How can theoretical propositions derived from phenomenon at one level of an organization or system be generalized to another level?

• How do scale and its extent and resolution affect the identification of patterns?
What barriers prevent scaling-up within and across organizations?

Edward Vytlacil (Stanford University) delivered a paper on “Heterogeneity in Returns to Treatment and Evaluating the Effect of Expanding a Program,” written with James Heckman (University of Chicago). Robert Moffit (Johns Hopkins University) presented a review of “Economic Models of Scale-Up.” Sanjay Dhar (University of Chicago Graduate School of Business) presented a paper considering “Why Store Brand Penetration Varies by Retailer” written with Stephen J. Hoch (The Wharton School of the University of Pennsylvania). Thomas D. Cook (Northwestern University) and Walter Kintsch (University of Colorado, Boulder) served as discussants; Anthony E. Kelly (George Mason University) chaired this session.

The third paper session considered the challenges of “Scaling Up from Prototype to Production.” Members of the information technology and engineering research and service sectors were asked to address:

- What experiences, models, processes, and craft knowledge can be culled from efforts to move from prototype to production in software engineering? In industrial engineering?
- Are there specific design components, benchmarks, and pre-existing conditions that should be considered before bringing an intervention to scale?
- Have developments in information and communication technologies influenced capacities for scale-up in your field?

Ian Foster (University of Chicago) discussed “Scalable Virtual Organizations: Dimensions and Technologies.” James G. Conley (Northwestern University) presented a paper on “Scaling from Prototyping to Production: A Managed Process for Commercial Offerings” written with
Robert C. Wolcott (Northwestern University), Barry Fishman (University of Michigan) and Geneva Haertel (SRI International) discussed the papers; Margaret Honey (Education Development Center) chaired the session.

The fourth paper session, “Scaling Up Promising Educational Interventions,” was designed to report the results of three IERI research projects. Principal investigators from three Phase 2 IERI research projects were asked to discuss their research, with particular attention to:

- What role do incentives play in determining the success of scale-up efforts?
- What are the challenges of creating change that affects the core of educational institutions?
- What approaches to ensuring fidelity of implementation have proven most effective?
- What evidence do practitioners and policymakers require before accepting promising educational interventions in their schools or districts? What criteria can education researchers encourage them to use in evaluating that evidence?

Barbara R. Foorman and her colleague Kristi L. Santi (University of Texas-Houston Health Science Center) discussed their project’s work “Scaling Assessment-Driven Intervention Using the Internet and Handheld Computers” based on a paper written with Larry Berger (Wireless Generation). Sharon Lynch (The George Washington University) discussed “Scaling-Up Highly Rated Middle Science Curriculum Units for Diverse Student Populations: Features that Affect Collaborative Research and Vice-Versa.” Robert E. Slavin (Johns Hopkins University) presented a paper written with Nancy A. Madden (Success for All Foundation) on “Scaling up Success for All: The First 16 Years.” Mark Berends (Vanderbilt University) discussed the
papers; Diana Cordova (Institute of Education Sciences, U.S. Department of Education) chaired the session.

The fifth paper session examined “Measurement Models for Scale-Up.” DRDC commissioned three papers from experts outside of education, including specialists in welfare-to-work program evaluation, the conduct and analysis of randomized trials investigating treatment for cancer, and organizational behavior to consider:

- What features characterize and distinguish conceptualizations of scale-up in health studies? In management research?
- What evidence is commonly used in your field before considering scale-up? What criteria do you use to evaluate the evidence before moving a project to scale? Are there specific design components, benchmarks, and pre-existing conditions that should be considered before bringing an intervention to scale?
- What are the key challenges in applying information from randomized controlled trials (RCT) to scale up interventions, and how can these challenges be overcome?

Howard S. Bloom (MDRC) presented “Linking Program Implementation and Effectiveness,” written with Carolyn J. Hill (Georgetown University) and James A. Riccio (MDRC). James J. Dignam (University of Chicago) presented a paper on the path “From Efficacy to Effectiveness: Translating Randomized Controlled Trial Findings into Treatment Standards.” The final paper in that session, “Measuring and Managing Successful Organizational Scale-Up,” by Eric G. Flamholtz (University of California, Los Angeles) and Yvonne Randle (UCLA and Management Systems Consulting Corporation) was presented via access grid technology, which allowed Dr. Randle to participate in the session from her offices in California.
O'Muircheartaigh (NORC and the University of Chicago) chaired the session and discussed the papers; Paul Horwitz (The Concord Consortium) also served as a discussant.

The sixth paper session considered “Measuring for Scale-Up in Education.” DRDC commissioned three papers to explore questions such as:

- What are some methods of maximizing systematic variance, minimizing error variance, and controlling extraneous variance?
- What are the methods of scaling up the research operation at the same time that the intervention is being brought to scale?
- What techniques can investigators use to measure the effectiveness of theories, aside from the effectiveness of intervention outcomes?
- How may conditions for study replication be ensured?

Geoffrey D. Borman (University of Wisconsin-Madison) discussed “National Efforts to Bring Reform to Scale in High-Poverty Schools: Outcomes and Implications.” Stephen W. Raudenbush (University of Michigan) discussed “Designing Field Trials of Educational Innovations.” Eva L. Baker (UCLA), author of the third paper on “Principles of Measuring Scale-Up” was ill and unable to attend the meeting; her paper will be included in the volume of conference proceedings. David Myers (Mathematica Policy Research, Inc.) and Okhee Lee (University of Miami) discussed the papers; Reid Lyon (National Institute of Child Health and Human Development) chaired the session.

The final (seventh) invited paper session examined “Challenges of Scale-Up: Notes from the Field.” DRDC commissioned papers from three IERI research projects to explore issues such as:
What models, processes, and craft knowledge can be culled from efforts to scale up exemplary education interventions?

Are there specific design components, benchmarks, and pre-existing conditions that should be considered before bringing an intervention to scale?

What evidence do practitioners and policymakers require before accepting promising educational interventions in their schools or districts? What criteria can education researchers encourage them to use in evaluating that evidence?

What are the major challenges to implementing interventions with fidelity in multiple contexts simultaneously?

Which factors are emerging as the major impediments to achieving sustainable results when exemplary interventions are scaled up from prototype or pilot to a wider context?

Jack Mostow (Carnegie Mellon University) presented the paper, "When the Rubber Meets the Road: Lessons from the In-School Adventures of an Automated Reading Tutor That Listens," written with Joseph Beck (Carnegie Mellon University). Nancy Butler Songer (University of Michigan) presented "Rethinking Fidelity and Sustainability in High Poverty Schools: Notes from Urban Detroit." James McPartland (Johns Hopkins University) presented a paper on "Scaling Up High School Reforms: Model Specificity and Local Buy-In," written with Robert Balfanz and Nettie Legters (both of Johns Hopkins University). James W. Pellegrino (University of Illinois-Chicago) and Penelope Peterson (Northwestern University) discussed the papers; Daniel B. Berch (IERI Program Officer at the National Institute of Child Health and Human Development) chaired the session.
Organization of the Meeting

The conference was held in the Washington, DC metropolitan area to enable attendance by IERI program staff and facilitate attendance by other senior agency officials. The venue was selected to provide (1) comfortable surroundings and a secluded atmosphere conducive to interaction among participants outside the main conference sessions, and (2) easy access to major area airports and local public transportation. DRDC selected the Park Hyatt Washington Hotel as the conference venue.

DRDC staff made two site visits in advance of the event, one to make necessary administrative arrangements regarding facilities, communications, and catering, a second to conduct a pilot test of the access grid installation. The conference meeting room was equipped with an overhead projector, a data/video projector, and a laptop computer with PowerPoint software. Presenters were encouraged to send DRDC copies of PowerPoint and other presentation materials via e-mail in advance of the conference. Presentations received in advance were checked for compatibility and installed on a local machine. During the conference, wireless microphones were provided for use by speakers and invited guests during periods of discussion. Communications specialists from inSORS, a grid equipment and service provider, were in attendance throughout the conference. A panel table and podium with microphone were situated on a raised dais at the front of the room. Seating for participants was arranged in crescent rounds, each of which accommodated up to eight individuals.

Prior to the meeting, members of the conference program were asked to provide the organizers with a short (250 word) biographical sketch. Paper authors were also asked to provide abstracts of their presentations. These materials were circulated to all participants in

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4 inSORS Integrated Communications “develops, markets, and supports enterprise collaboration software and solutions that enable multi-point communication of applications and their output of business processes.” See http://www.insors.com/ for additional information on the company.
advance via the DRDC web site. As this was an invitational conference, DRDC created a restricted-access password-protected area within the main DRDC website, which allows access by participants only. This site was created to be accessed directly at URL

http://drdc.uchicago.edu/csucsu/private/index.shtml and through links provided on the main DRDC site. A brief description of the conference was also included on the public production site (at http://drdc.uchicago.edu/csucsu/). The restricted-access website was launched one week prior to the conference. DRDC sent instructions for accessing the site to all participants on October 29th. Upon registration, participants were given name tags and folders containing a letter of welcome, agendas, and a table placard displaying the participant’s name.

The conference was designed to take place over the course of a day and a half, to minimize the amount of time participants would spend away from their home institutions. The conference was scheduled to begin in the afternoon so that participants traveling to the conference would be able to arrive that same day. In particular, members of the conference program were encouraged to avail themselves of this opportunity to minimize accommodation costs to the conference organizers.

Six of the seven main paper sessions were scheduled to take place over the course of a 90-minute period, according to the following format:

- Three 15-minute presentations from authors of three commissioned papers;
- Two 12-minute presentations by discussants commenting on the papers;
- Six minutes for the chair to introduce the speakers; and
- Fifteen minutes for discussion.
The seventh paper session was scheduled to take place over a 30-minute period, allowing two 10-minute paper presentations, seven minutes for commentary from a single discussant, and three minutes for the chair to introduce the speakers.

An introductory session of welcoming remarks began at 1:00 pm and was scheduled to conclude 45 minutes later. Three paper sessions and a coffee break took place that afternoon. The meeting adjourned at 5:30 pm. NORC at the University of Chicago hosted a reception at 6:00 pm in the conference hotel, followed by a conference dinner and keynote address. Continental breakfast was offered to all participants Tuesday beginning at 8:30 am; the meeting reconvened at 9:00 am for two paper sessions. Luncheon was provided, followed by two additional paper sessions. DRDC Principal Investigator Barbara Schneider closed the conference with concluding remarks. The conference was adjourned at 5:00 pm. A complete conference schedule is included in Appendix A.

Participants

Members of the Conference Program

Two-thirds of the 45 individuals who accepted DRDC's invitation to appear on the conference program are affiliated with the IERI research program. Nine current and former IERI agency officials and program officers joined nineteen IERI investigators, six education researchers not then affiliated with an IERI-funded research project, and twelve researchers from disciplines outside education (see Table 2). A full list of the members of the conference program (including paper co-authors, not all of whom addressed the meeting) is included in Appendix B.
Table 2. Members of the Conference Program

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<thead>
<tr>
<th>IERI / Education Research</th>
<th>Role on the Conference Program</th>
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<tbody>
<tr>
<td>Affiliation</td>
<td>Session chair</td>
</tr>
<tr>
<td>Current / former IERI agency official / program officer</td>
<td>5</td>
</tr>
<tr>
<td>IERI investigator</td>
<td>2</td>
</tr>
<tr>
<td>Non-IERI education researcher</td>
<td>1</td>
</tr>
<tr>
<td>Non-education researcher</td>
<td>--</td>
</tr>
<tr>
<td>TOTAL</td>
<td>8</td>
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</tbody>
</table>

*a One IERI investigator served as both a discussant and a session chair; a total of 45 individuals fulfilled the 46 roles on the conference program.

Two members of the conference program notified the organizers within three days of the meeting that they would be unable to attend. Given the late notice, replacements were not found; instead, the additional time was allocated to other speakers in the sessions in question. In each case, DRDC notified all members of the relevant sessions of this change in scheduling in advance.

Members of the Audience

DRDC invited all IERI principal investigators not already members of the conference program to attend the meeting. Several PIs extended this invitation to other members of their
project teams. Invitations were also extended to IERI program staff and non-IERI agency staff with a particular interest in the topic of the meeting. A total of 96 individuals participated in the conference. A complete list of the program participants is included in Appendix C. In addition, approximately 30 graduate and undergraduate students enrolled in a sociology of education course at the University of Chicago were able to attend the conference virtually using the grid technology described above.

Evaluations

All conference participants were asked to complete an evaluation form, distributed at the conference. A second copy of the form was mailed one week after the events to all participants who did not submit a completed form at the conclusion of the conference. A copy of the participant evaluation form is included in Appendix D. These evaluations were designed to elicit participants’ assessments of the content of each session as well as its contribution to their understanding of scale-up. Additionally, participants were asked to evaluate conference organization and logistics. Since each session was related to one of the four conference themes—Conceptions of Scale-Up, Measuring for Scale-Up, Challenges of Scale-Up, and Results of Scale-Up Initiatives—the findings from these evaluations are also useful in assessing the effectiveness of the conference themes. Even after follow-up requests for evaluations, only 16 percent of those attending the conference submitted completed evaluation forms; an additional 3 percent provided feedback in the form of e-mailed comments on at least some aspects of the conference. Results of the completed evaluations are summarized below.
Participants’ Evaluations

Theme 1: Conceptual, Theoretical, and Analytic Perspectives on Scale-Up

Sessions 1 and 2 addressed conceptualizations of scale-up. Session 1, “Theoretical and Analytical Models for Scale Up: An Educational Perspective,” was rated as the best of all the sessions in the conference. Respondents gave excellent marks to the content of this section as well as its contribution to their understanding of scale-up. Of fourteen respondents, twelve rated the content “excellent” or “good”. Session 2, “Theories and Models from the Social Sciences,” received the lowest marks overall, although some very favorable comments were made. For example, one respondent indicated that the session was “very interesting, with occasional ramifications for my work and understanding of scale-up.” Another respondent found the material presented in this session “more difficult to assimilate” but noted that it provided “invaluable information, especially given the scale-up process we are researching.”

Theme 2: Measuring for Scale-Up

Two sessions addressed issues of measuring for scale-up. Evaluations of Session 5, “Measurement Models for Scale-Up,” were positive, but mixed. Most respondents felt that the content of the session was either “excellent” or “good” and that the session was applicable to their work and aided their understanding of scale-up. A few participants, however, rated these sessions more negatively.

Responses for Session 6, “Measuring for Scale-Up in Education,” were largely positive. The session received strong marks for content; the majority of respondents rated the session “excellent” or “good” and reported the session had provided them with an “excellent” or “good” understanding of scale-up.
Theme 3: Challenges of Scaling Up Promising Interventions

Two sessions addressed challenges of scale-up: Session 3, “Scaling-Up from Prototype to Production,” and Session 7 “Challenges of Scale-Up: Notes from the Field.” Session 3 received mixed reviews; while responses were generally positive, respondents’ assessments of both the content and the applicability of the session ranged widely.

Responses for session 7 were also generally positive. Four out of five respondents found the session to be either “excellent” or “good”; nine out of ten rated the session “excellent” or “good” in terms of its applicability to their own work and research.

Theme 4: Results of Scale-Up Initiatives

Only one session was devoted to reporting the results of scale-up initiatives: Session 4, “Scaling Up Promising Educational Interventions.” This session received strong reviews for both content and applicability. The majority of respondents ranked the session content “excellent”; half found the session to be “excellent” in terms of its applicability to their own work and research.

Summary of Comments and Suggestions

The high marks given to most of the conference sessions indicate that participants found the interdisciplinary nature of the conference helpful. There was no clear divide between ratings of sessions focusing on scale-up from within and outside the realm of educational research. Most of the individual conference sessions received high ratings for both content and contribution to the participants’ understandings of research. The responses also suggest an interest in developing further knowledge of the science of scale-up—for example, a desire to see more emphasis on specific models used in different industries, and fuller considerations of these models’ connections to education research and practice. Notably, in a
conference devoted to consideration of scale-up from multidisciplinary perspectives, this audience of education researchers rated the content and intellectual value of the two sessions devoted to considering scale-up from an educational perspective most highly. Two of the individual presentations which received the most praise were given by acknowledged experts in educational researchers—Larry V. Hedges and David K. Cohen. Respondents also made extremely complimentary comments about the discussion of papers on theories and models from the social sciences given by Thomas D. Cook, while a full third of the respondents singled out Stephen Raudenbush’s discussion of the design of field trials for educational innovations as particularly valuable.

The feedback on the structure and organization of the conference emphasized the importance investigators place on opportunities for discussion. A third of the respondents felt that time could—and should—have been managed more effectively with “more time control over speakers.” To increase the time devoted to exchange, some presenters suggested that presentations could be made shorter and that the breaks between sessions could be lengthened. In terms of preparation, many participants did not find the circulation of materials prior to the conference to be helpful. However, participants often remarked that the DRDC staff was extremely helpful and organized, noting that the staff was very responsive to problems and questions and that the conference ran smoothly.

The completed evaluations contained other constructive critical remarks, which will enhance planning for future events. Most such comments were made in the context of generally positive evaluations. Only one individual was negative in evaluating the conference overall. That respondent was concerned that the conference reflected “a huge disconnect between what IERI researchers need to be successful and what DRDC thinks they need” and
observed, “We need you! And not to spice up our lives with random stuff that might vaguely make us better people. We are not liberal arts students needing to become better rounded.” These concerns raise important issues regarding the contributions individual investigators do—and do not—look to DRDC to provide, and will be taken into account in planning future activities.

The vast majority of respondents’ comments, however, were very positive. For example, one respondent indicated the conference would “probably serve as the foundation for my ever-broadening understanding of scale-up.” Another noted that “it was helpful to get a broader view of how scale-up is perceived and enacted in other disciplines. This is not always directly applicable but can often stir a connection to one’s own work that hasn’t surfaced by examining only within one’s field.” One participant wrote to DRDC over a month later to say that he had found the conference “to be very helpful in moving forward my thinking about implementation at various levels of scale.” Another wrote to thank DRDC for “putting together an outstanding conference. The event left no doubt that the conference was intelligently conceived, well planned, and carefully executed . . . bringing a challenging set of ideas to fruition in the form of an interesting one-and-a-half days of discussion.”

Conference Organizers’ Evaluations

Overall DRDC is pleased with the results of the conference. Based on participant feedback and our own judgments and experiences, we believe the conference could have been improved further with greater attention to timekeeping, and the provision of more time for discussion—both at the conclusion of individual paper sessions, and informally throughout the conference.
We were pleased to have had this opportunity to demonstrate grid technology to conference participants. We were particularly pleased with high level of performance of the technology itself, due in large part to the efforts of our vendor, inSORS, working closely with our own technology officer. This was especially gratifying given that the venue was not pre-equipped with grid technology or the requisite high-speed internet access. Our experience suggests it is feasible to utilize grid technology from locations without a pre-existing installation. However, we do not feel that the meeting was structured to demonstrate grid technology’s full potential to facilitate collaboration among the IERI research community. We feel it will be important in future events to showcase the technology to better effect. Achieving both this and the objective of better timekeeping suggests that future events should provide a more visible role for DRDC administrative staff. In keeping with our general philosophy of facilitating rather than directing interaction among our IERI colleagues, it will be important to craft such roles to ensure they do not overshadow the core roles we will continue to create for IERI researchers in future conferences and workshops.

Plans for the Future

DRDC is editing final versions of papers presented at the conference for inclusion in a conference volume. In the meantime, many authors are making draft versions of their papers available in PDF format to conference participants via the DRDC restricted-access conference website (at http://drdc.uchicago.edu/csu/private/proceedings.shtml).

“Conceptualizing Scale-up: Multidisciplinary Perspectives” provided an opportunity for researchers in the field of educational scale-up to learn about the processes of scale-up in other fields. It strengthened lines of communication across disciplines and provided additional
networking opportunities within and across the IERI research community. Based on our generally positive experience with this conference, DRDC looks forward to working with IERI program staff and our IERI project colleagues to organize and host additional conferences and workshops of interest to this research community.
References


Appendix A:

Schedule of Conference Activities
## Agenda:

**Monday, November 3rd**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>1:00-1:45 pm</td>
<td>Introduction</td>
</tr>
<tr>
<td>1:45 - 2:15 pm</td>
<td>Theoretical and Analytic Models for Scale-Up: An Educational Perspective</td>
</tr>
<tr>
<td>2:15 - 3:45 pm</td>
<td>Theories and Models from the Social Sciences</td>
</tr>
<tr>
<td>3:45 - 4:00 pm</td>
<td>Coffee break</td>
</tr>
<tr>
<td>4:00 - 5:30 pm</td>
<td>Scaling-Up from Prototype to Production</td>
</tr>
<tr>
<td>6:00 - 6:45 pm</td>
<td>Reception</td>
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<td>7:00 pm</td>
<td>Conference dinner and address</td>
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**Tuesday, November 4th**

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<th>Time</th>
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<tr>
<td>8:30 - 9:00 am</td>
<td>Continental breakfast</td>
</tr>
<tr>
<td>9:00 - 10:30 am</td>
<td>Scaling-Up Promising Educational Interventions</td>
</tr>
<tr>
<td>10:30 - 10:45 am</td>
<td>Coffee break</td>
</tr>
<tr>
<td>10:45 am - 12:15 pm</td>
<td>Measurement Models for Scale-Up</td>
</tr>
<tr>
<td>12:15 - 1:30 pm</td>
<td>Lunch</td>
</tr>
<tr>
<td>1:30 - 3:00 pm</td>
<td>Measuring for Scale-Up in Education</td>
</tr>
<tr>
<td>3:00 - 4:30 pm</td>
<td>Challenges of Scale-Up: Notes from the Field</td>
</tr>
<tr>
<td>4:30 - 5:00 pm</td>
<td>Concluding Remarks</td>
</tr>
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</table>

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**Conference Proceedings:**

Final versions of papers are being edited for inclusion in a conference volume. In the meantime, many authors are making draft versions of their papers available in PDF format. See Conference Proceedings for a list of draft papers currently available online.
Appendix B:

Members of the Conference Program
DRDC invited a small number of leaders in fields that routinely extend successful innovations (for example, into organizational structures, from prototype to production) to present an overview of the knowledge and experiences of scaling developed in their disciplines. The conference began on Monday, November 3, with remarks from Duane F. Alexander MD, Director of the National Institute of Child Health and Human Development at the National Institutes of Health; Judith Ramaley, Assistant Director, Education and Human Resources Directorate at the National Science Foundation; and Grover J. (Russ) Whitehurst, Director of the Institute of Education Sciences at the U.S. Department of Education. Over the course of the next two days, participants heard from scholars who identified, compared, and contrasted the concepts and methods commonly used to scale up programs and processes in manufacturing, marketing, software engineering, management and organizational theory, public health, economics, sociology, and education. The conference program included:

Duane F. Alexander, MD  
National Institute of Child Health and Human Development  
National Institutes of Health

Eva L. Baker  
UCLA

Robert Balfanz  
Johns Hopkins University

Daniel B. Berch  
National Institute of Child Health and Human Development  
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Appendix D:

Evaluation Form
### I. CONFERECE CONTENT

How intellectually valuable did you find the contributions made in each of the following sections to conceptualizations of scale-up?

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<thead>
<tr>
<th>Section</th>
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What were the most valuable contributions made in each section?

- Section I
- Section II
- Section IV
- Section V
- Section VI
- Section VII
Which section(s) exposed you to new ideas and concepts that you might use in your research? Please elaborate.

Do you think that interdisciplinary nature of the conference will in any way contribute to or have an impact on your research goals or agenda? Please elaborate.

III. ACCESS GRID - Technology

Use of Technology

Please rate your level of comfort in using the following forms of technology:

<table>
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<tr>
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<th>Excellent (5)</th>
<th>Good (3)</th>
<th>Fair (2)</th>
<th>Poor (1)</th>
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<td>4. Video Conferencing</td>
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Please rate your overall experience of participating in a conference supplemented by Access Grid technology

How could Access Grid technology be beneficial in enhancing your research?