

Students as System Thinkers: Scaling-up and Sustaining Innovations in Schools

Systems Thinking in Schools Institute, St. Louis

March 2012

Group Model Building

Facilitation Manual



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Roles of Facilitation Team

Group model building involves successfully managing multiple roles from starting a session, to facilitating an exercise, and documenting the process.¹ While a session could potentially be completed by as few as two experienced facilitators, the results may be compromised, at times, as the facilitators have to balance group process with the need to produce outputs using a series of structured exercises. Consequently, group model building is typically done in teams with one or more roles assigned to each team member. Below are some of the team roles needed for this project along with a description of their primary function and qualifications:

Debrief (1): The debriefer leads the facilitation team in quick process checks and after-session debriefs to understand what worked well and what could have been improved, and gives the team a chance to decompress after a group model building session.

Facilitator, co-facilitator (2): The facilitators should have group facilitation experience, be familiar with the participants in the room and the issues they are facing, and be trained on how to use the exercises in this manual. The primary function of the facilitators is to lead the group through the exercises and to facilitate the discussions.

Meeting opener/closer (1): The meeting opener/closer convenes the meeting and brings the meeting to a close. This person is familiar with the project and its importance, and usually a recognized leader within the group. They provide a context for the overall issue and process. They do not have to be someone who was on the core modeling team or participated in the design of the sessions. The primary function of the meeting opener/closer is to start and end the meeting.

Modeler (1): The modeler is someone who is experienced in system dynamics modeling and modeling software (e.g., Vensim, iThink/STELLA) and has some experience in group model building. The modeler develops the model and helps the group reflect on model structures that emerge during the session.

Modeler facilitator (1): The modeler facilitator is someone who has some experience in system dynamics and group model building facilitation. The modeler facilitator works with the facilitator and focuses on developing the diagrams, introducing concepts from system dynamics, and translating participants' statements into phrases that are easier for the modeler to use.

Process coach (1): The process coach is someone who is familiar with exercises and an experienced group facilitator. The primary function of the process coach is to provide assistance to the facilitators when needed, troubleshoot, and bring consistency across sessions. For example, the process coach may help out participants if they get lost, gently remind them about the time left for an exercise, or step in to help facilitate if the facilitators are stuck and not sure how to proceed with a group.

Production coordinator (1): The production coordinator takes products being developed during the session (e.g., causal loop diagrams) and creates a tangible deliverable that participants can use during and after the session. It is important that the production coordinator is familiar with the printing and production facilities, software packages being used (e.g., Vensim, iThink/STELLA, PowerPoint), and has some experience preparing printed materials involving system dynamics diagrams.

¹ Richardson, G. P., & Andersen, D. F. (1995). Teamwork in group model building. *System Dynamics Review*, 11(2), 113-137.

Recorder (1): There will be one recorder will take notes during the large group discussions. The primary function of the recorder is to document the discussion and products, and then distribute the documentation to members of the facilitation team. Sessions may have an additional recorder if needed.

Wall builder (1): The wall builder is someone who is able to cluster concepts in meaningful categories based on the conversation in the room. It is helpful if the wall builder have some familiarity with the context of the issue being discussed. The wall builder arranges participants' results on the wall into clusters as part of an exercise.

Detailed Agenda

“Students as System Thinkers: Scaling-up and Sustaining Innovations on Schools”

Systems Thinking in Schools Institute: March 9, 2012

Purpose:

Workshop participants will be introduced to group model building and work through a series of structured small group exercises to develop a model of innovation scale-up and sustainability in schools with a specific focus on the goal of developing students as systems thinkers. Using the model, participants will (1) identify barriers and solutions to scale-up and sustainability of innovations from a systems perspective, and (2) leave with concrete strategies for advancing systems thinking within their organization.

Detailed Agenda:

Time	Activity	Description	Materials/Roles
7:30	Room setup	<ul style="list-style-type: none"> Tables and chairs are organized in the room for the GMB session. All the materials that will be needed are moved into the room. 	
8:30	Convening group and opening session	<ul style="list-style-type: none"> The opener starts the session, welcomes participants, provides an overview of the day, bathroom facilities, scheduled breaks, etc. Also covered will be the requirements for anyone seeking social work CEUs. The opener then leads a brief introduction of the modeling team and participants asking participants to briefly state if they have previously attended a Level I or Level II training, taking a course in systems thinking or system dynamics, etc. The opener then reviews the purpose of the day and a <u>brief introduction</u> that we will be doing group model building and what group model building is, adding that the session is documented in a facilitation handbook that will be distributed at the end of the session. 	<ul style="list-style-type: none"> Agendas Opener: Peter
8:45	Hopes and Fears Script	<ul style="list-style-type: none"> The facilitator will lead the group in the “Hopes and Fears” script exercise for this day’s session on scaling-up and sustaining systems thinking in schools. The recorders take notes on the explanation for each hope and fear shared by participants. The wall builder will cluster the participants’ hopes and fears on the wall and process the themes that emerge. 	<ul style="list-style-type: none"> Paper (2 different colors), blue tape, markers Facilitator: Aiden and Timothy Wall Builder: Lorena Recorder: Allison
9:20	Review wall	<ul style="list-style-type: none"> The wall builder summarizes to the group the major themes of the hopes of fears 	<ul style="list-style-type: none"> Wall Builder: Lorena
9:25	Behavior Over Time Graphs Script	<ul style="list-style-type: none"> The facilitator leads participants through the “Behavior Over Time Graphs” script. The facilitator gives a brief definition of ‘systems thinking’ and seeks 	<ul style="list-style-type: none"> Paper, blue tape, markers Facilitator: Aiden and Timothy

Time	Activity	Description	Materials/Roles
		<p>consensus, then asks participants to take the next 5 minutes to “Draw graphs over time of things that affect or affected by scaling-up systems thinking in schools.”</p> <ul style="list-style-type: none"> The wall builder then clusters the participants’ BOTGs in themes. At the end of the exercise, the wall builder reflects back the thematic clusters to the group, and brings this portion of the session to a close. Discuss other interpretations for themes. 	<ul style="list-style-type: none"> Wall Builder: Lorena Recorder: Allison
10:15	Dots Scripts	<ul style="list-style-type: none"> The facilitator then leads participants immediately before break in the “Dots Script” where participants vote on the most important BOTGs. 	<ul style="list-style-type: none"> Facilitator: Lorena
10:30-10:45	BREAK/CMT check-in	<ul style="list-style-type: none"> The process coach leads the CMT in a quick check-in to see how the workshop is going 	<ul style="list-style-type: none"> Process Coach: Peter
10:45	Reference Mode	<ul style="list-style-type: none"> The modeler-facilitator will introduce the concept of a reference mode and work with the group to come to a consensus on the reference mode on scale-up and sustainability of systems thinking in schools. 	<ul style="list-style-type: none"> Modeler Facilitator: Timothy
10:55	Causal Mapping with Participants Script	<ul style="list-style-type: none"> The facilitator leads the participants through the “Causal Mapping with Participants” script. The modeler-facilitator draws the links on the white board as each link is nominated. The recorders take notes on each nominated link including the loop polarity. The modeler records the causal loop diagram being drawn at the front of the board in Vensim. 	<ul style="list-style-type: none"> Facilitator: Aiden and Timothy Modeler-facilitator: Timothy Modeler: Meagan Recorder (am): Allison
11:40	Model Review Script	<ul style="list-style-type: none"> The modeler then presents the projected model based on what they have shared during the causal mapping script. The convener will then lead a brief overview of where we are at in the modeling process and day before breaking for lunch. 	<ul style="list-style-type: none"> Modeler: Meagan Recorder: Allison
12:00-1:00	LUNCH/ CMT check-in	<ul style="list-style-type: none"> The process coach leads the CMT in a quick check-in to see how the workshop is going production coordinator prints out model for participants 	<p>Lunch Supplies</p> <ul style="list-style-type: none"> Process Coach: Peter Production Coordinator: Rachele
1:00	Action Ideas Script	<ul style="list-style-type: none"> The facilitator leads participants through the “Actions Ideas” script. As the facilitator places the action ideas from each sheet on the wall, the modeler maps in the action idea into the CLD, and recorders take notes on the idea, description, high versus low impact, and easy versus hard to implement. The facilitator probes to elicit barriers and facilitators of implementing actions, which the recorders transcribe. 	<ul style="list-style-type: none"> Deliverable—printout of model from morning session Paper, tape, and markers Facilitator: Aiden Modeler: Meagan Recorder: Alissa
2:00	Intervention	<ul style="list-style-type: none"> The facilitator then divides the participants into 5 groups and leads participants through the 	<ul style="list-style-type: none"> Flipchart paper Facilitator: Aiden &

Time	Activity	Description	Materials/Roles
	Design Script	<p>“Intervention Design” script where participants pick their favorite action idea and develop an intervention.</p> <ul style="list-style-type: none"> The facilitator asks each group to present their intervention and supporting rationale. Each group takes 5 minutes. The recorder takes notes on each intervention using the PowerPoint template. 	<p>Timothy</p> <ul style="list-style-type: none"> Recorder: Alissa
3:00	Closing	<ul style="list-style-type: none"> The facilitator will ask participants to reflect on their learning in the modeling process. This includes insights and application of their learning to their organizational context. The closer will thank the participants for their participation in the GMB session, provide an overview of what was accomplished, and review how the group did with respect to the original hopes and fears. Production coordinator will coordinate the printing of the packets for the participants, including the following: GMB Facilitation Manual, original model, model with action ideas, list of action ideas, and list of interventions. 	<ul style="list-style-type: none"> Deliverable—packet with original model, model with action ideas, list of action ideas, and list of interventions. Facilitator: Aiden Closer: Peter Production coordinator: Rachele
3:45	Evaluation	<ul style="list-style-type: none"> The facilitator will discuss the importance of the input and comments that can be gathered through a post-evaluation. The facilitator will distribute the evaluation forms to participants to fill out in the last 10-15 minutes of the workshop. The facilitator will collect the forms as the participants finish The production coordinator will provide a packet with original model, model with action ideas, list of action ideas, and list of interventions for each participant. This will be available as participants complete the evaluation. 	<ul style="list-style-type: none"> Evaluation Forms Facilitator: Aiden Production coordinator: Rachele
4:00	Core Modeling Team Reflection	<ul style="list-style-type: none"> The core modeling team will engage in a post-workshop reflection session led by the debrief. The core modeling team will discuss strengths, challenges, emotional reactions, and places for adjustment or improvement. 	<ul style="list-style-type: none"> Debrief: Peter Core Modeling Team

Scripts

Group model building sessions typically consist of a sequence of small group activities or “scripts”.² These scripts describe the essential components of an exercise along with the inputs from other exercises needed to do the script and the outputs produced from the script. There are scripts for working directly with participants (“online” scripts) as well as scripts for the facilitation team before and after a group model building session (“offline” scripts).

² Andersen, D. F., & Richardson, G. P. (1997). Scripts for group model building. *System Dynamics Review*, 13(2), 107-129.

Hovmand, P. S., Andersen, D. F., Rouwette, E., Richardson, G. P., Rux, K., & Calhoun, A. (2012). Group model building "scripts" as a collaborative tool. *Systems Research and Behavioral Science*, 29, 179-193.

Hopes and Fears

Description	Process elicits hopes and fears around group model building
Context	At the beginning of a group model building project
Primary nature of group task	Divergent
Time	Preparation: None Session: 30 minutes Follow-up: None
Materials	<ul style="list-style-type: none"> • Two different colors of office paper (8.5 x 11) with enough for multiple sheets for each participant • Thick markers • Blue "painters" masking tape
Inputs	None
Outputs from this script	List of participants' hopes and fears
Roles	<ul style="list-style-type: none"> • Facilitator with good group facilitation skills • Wall Builder who can cluster graphs on a wall based • Recorder who can record hopes and fears that participants share
People in the room	<ul style="list-style-type: none"> • Participants • All members of the core modeling team
Steps	<ol style="list-style-type: none"> 1. Participants are given several sheets of paper in each color. The facilitator explains that they will be writing their hopes and fears for the project, and then sharing them with the group. 2. The facilitator states which color represents hopes and which represents fears. 3. Participants are then given 3-5 minutes to write down their hopes and fears for the project. 4. In a round-robin fashion, each participant then reads one fear and one hope at a time. The facilitator takes each hope and fear that the participant has read and posts it on the wall. After each participant has had a chance to share once, the facilitator goes around the room until everyone has shared all of their hopes and fears. 5. The wall builder takes the sheets of papers with the hopes and fears and clusters the themes. 6. The wall builder then tries to identify some of the themes of the hopes and fears. 7. Recorders write down the hopes and fears.
Evaluation criteria	<ul style="list-style-type: none"> • Participants have shared both their hopes and fears for the upcoming project • Participants understand the overall themes of the hopes and fears.
Authors	George P. Richardson and David F. Andersen
History	Not applicable
Revisions	Revised March 6, 2012 by Peter Hovmand

References	<p>Andersen, D. F., & Richardson, G. P. (1997). Scripts for group model building. <i>System Dynamics Review</i>, 13(2), 107-129.</p> <p>Luna-Reyes, L. F., Martinez-Moyano, I. J., Pardo, T. A., Cresswell, A. M., Andersen, D. F., & Richardson, G. P. (2006). Anatomy of a group model-building intervention: Building dynamic theory from case study research. <i>System Dynamics Review</i>, 22(4), 291-320.</p>
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Behavior Over Time Graphs

Description	Participants produce sketches of key variables over time, which are clustered by the modeling team
Context	Framing the problem, initiating mapping, eliciting variables, and input to deciding the reference modes for the study
Primary nature of group task	Divergent
Time	Preparation: 10 minutes Session: 45-60 minutes Follow-up: N/A
Materials	<ul style="list-style-type: none"> • Stacks of 8.5x11 white paper with axis drawn on them • Large blank wall/white board • Fat markers • Glue sticks, blue tack, or tape • Camera or other method to capture the graph
Inputs	None
Outputs from this script	Candidate variables for the dynamic model or causal map
Roles	<ul style="list-style-type: none"> • Facilitator to work with the group with some experience with SD • Modeler listening to what is being graphed and the way people are talking about the graphs who must also be able to conceptualize early seeds of system structure. • Wall builder to cluster graphs and talk about themes with little or no experience in SD • Recorder to document the session and photograph the clustered graphs
People in the room	<ul style="list-style-type: none"> • Participants • All members of the core modeling team
Steps	<ol style="list-style-type: none"> 1. Based on group size, decide whether to break participants into subgroups. In smaller groups $N < 10$, allow individuals to work and present independently. In larger groups $N > 10$, divide participants into groups of roughly $N/10$. Ask the subgroups to sit together. 2. The modeling team hands out sheets of white paper to each participant or group. 3. The facilitator gives an example of how to draw a behavior over time graph, carefully labeling X-axis "Time" with start time, end time, and now indicated with a vertical dashed line. The Y axis is labeled with a variable name. The facilitator then sketches the behavior. 4. The facilitator then asks participants to draw one variable over time per piece of paper. The participants should be given the option of including hoped for behavior, expected behavior, and feared behavior on the same graph. 5. The facilitator and wall builder walk around and help participants with the task if they need it. Allow 15 minutes or until the group runs out of steam to complete the task. 6. Reconvene as large group. <ul style="list-style-type: none"> A: If $N < 10$, the facilitator takes one graph at a time from each participant, holds it up in front of entire group and asks him/her to talk about it. Ask for participants to share the "best stuff" first. Clarify timescale, variable names, etc. B: If $N > 10$, instruct subgroups to share their graphs with each other and choose the ones they think are most important. The facilitator then goes to each subgroup and

	<p>holds the first graph they have selected up in front of entire group. The subgroup spokesperson talks about the graph. Ask subgroups to share the “best stuff” first. Clarify timescale, variable names, etc.</p> <ol style="list-style-type: none"> 7. The facilitator then hands the graph to the wall builder. 8. The facilitator repeats steps 6 and 7 with each participant or subgroup, taking one graph at a time until all graphs are shown or time has run out. Finish by asking if any participant has something else that really ought to be shown. 9. During steps 7-8, each graph is posted on the wall. The wall builder tries to cluster the graphs meaningfully on the fly, based on themes and variables. 10. The facilitator asks the wall builder to explain the clusters of graphs on the wall. The wall builder tries to summarize dynamics that help to characterize the problem that emerges from the participants’ graphs. 11. The facilitator enables the participants to talk about the clusters and the characterization of the problem they imply. 12. Consider labeling the clusters based on themes or related variables 13. There is potential for the modeler to close by highlighting the beginnings of feedback thinking in the dynamic problem.
Evaluation criteria	<ul style="list-style-type: none"> • Interesting, self-sustaining group discussion after clusters described by the wall builder • Meaningful clusters are possible to see • Graphs tend to converge to a clear dynamic problem • Some key dynamic variables emerge from reflecting on the graphs and clusters • Modeling team can begin to see key stocks and perhaps important feedback loops • Members of the group appear to have better understandings of the issues of interest to other members
Authors	George P. Richardson and David F. Andersen
History	NA
Revisions	NA
References	Andersen, D. F., & Richardson, G. P. (1997). Scripts for group model building. <i>System Dynamics Review</i> , 13(2), 107-129.

Dots

Description	Participants prioritize results from a previous exercise (e.g., graphs over time) by placing adhesive dots or check marks by each item.
Context	There are many times during GMB sessions where it is important to prioritize or reduce the number of items the group is working on. This might be to choose the top « X » Behavior Over Time Graphs (BOTGs) for inclusion in the model, or to pick the stocks that will be incorporated.
Purpose	<ul style="list-style-type: none"> To sift through many possible choices and select those most important to the participant group.
Primary nature of group task	<ul style="list-style-type: none"> Evaluative
Time	<p>Preparation: 5 minutes to cut up adhesive sheets for each participant</p> <p>Session: Depending on the size of the group and # of dots given, this can take 5-15 minutes. Consider doing this at the beginning of a break to save time.</p>
Materials	<ul style="list-style-type: none"> Three to five dots per participant depending on the packaging of adhesive dots Alternatively, this can be done using markers and check marks
Inputs from other scripts	<ul style="list-style-type: none"> An array of items to vote on with dots, for example, a set of behavior over time graphs
Outputs from this script	<ul style="list-style-type: none"> Prioritized choices
Modeling team roles	<ul style="list-style-type: none"> Facilitator to introduce the exercise
People in the room	<ul style="list-style-type: none"> Participants All members of the core modeling team
Steps	<ol style="list-style-type: none"> The facilitator gives every participant the same number of dots. The facilitator instructs participants to place their dots beside the items they think are most important to them. They can distribute the dots any way they want (e.g. put all of them on behavior over time graph or spread dots out across several graphs). The facilitator tallies the dots beside each item to create a ranked list of importance.
Evaluation criteria	<ul style="list-style-type: none"> Participants have prioritized their choices. Participants have achieved consensus on the most important items.
Author(s)	Unknown
History	Unknown
Revisions	Documented March 6, 2012 by Timothy Hower and Peter Hovmand
References	NA

Causal Mapping with Participants

Description	Building a causal loop or stock-flow diagram from discussion
Context	Causal structures are emerging in a discussion that one wants to capture, reflect back, and revise with the group of approximately 15 or fewer people
Purpose(s)	<ul style="list-style-type: none"> Eliciting feedback loops
Nature of group task	Divergent
Time	<p>Preparation time: 10 minutes</p> <p>Time required to complete steps in script: 40 minutes</p> <p>Follow up time: up to 50 minutes to transcribe results into software (e.g., Vensim, iThink/STELLA) if this done after the session.</p>
Materials needed to complete script	<ul style="list-style-type: none"> 10-20 sheets of paper per modeler Pencils or pens Whiteboard, chalkboard, or other type of surface to organize variables and draw links between them System dynamics modeling software (e.g., Vensim, iThink/STELLA)
Inputs from other scripts	<ul style="list-style-type: none"> Set of variables
Outputs from this script	<ul style="list-style-type: none"> Causal map between variables
Modeling team roles required and expertise needed	<ul style="list-style-type: none"> Facilitator with good group facilitation skills and familiar with local context of issue being discussed Modeler facilitator with experience in group facilitation and system dynamics modeling Recorders who are able to take notes (e.g., on paper or computer) of causal linkages between variables as they are discussed Modeler with expertise in system dynamics modeling software (e.g., Vensim, iThink/STELLA) who is able to draw causal linkages as participants share their examples
Who is in the room?	<ul style="list-style-type: none"> Participants who are discussing an issue and naming linkages Core Modeling Team
Steps	<ol style="list-style-type: none"> The facilitator explains the big picture of what is to be accomplished in the structure elicitation portion, and distributes the worksheet. The modeler facilitator introduces the conventions of causal diagrams to participants including the direction of influence (e.g., $X \rightarrow Y$) and the polarity (e.g., + or -). An example can be introduced to illustrate the connections. The facilitator then asks participants to work individually ($N < 10$) or in pairs ($N > 10$) to identify causal linkages they see among variable identified from the previous exercise. Each link should relate at least two variables with a directed arc/arrow and identify the link as either positive or negative (+/- to indicate polarity, or direction of change). The facilitator will use a nominal technique for pairs to nominate linkages. As the facilitator asks each participant to share their favorite link, the modeler facilitator adds the link to the board. When the participants create a balancing or reinforcing feedback loop, the

	<p>modeler facilitator points this out to the group and briefly explains the behavior of a balancing or reinforcing feedback loop.</p> <p>6. The modeler draws the emerging diagram on the wall in the modeling software (e.g., Vensim, iThink STELLA).</p>
Evaluation criteria	<ul style="list-style-type: none"> • A rich causal diagram linking variables from the earlier exercise • Participants understand the conventions of causal maps • Participants have been introduced to the concept of a balancing and reinforcing feedback loop
Author(s)	Unknown
History for Script	N/A
Revisions	Revised March 6, 2012 by Peter Hovmand and Timothy Hower
References	N/A

Model Review Script

Description	Reviewing the causal loop or stock-flow diagram built from discussion
Context	Causal structures are identified and demonstrated through the creation of a model
Purpose(s)	<ul style="list-style-type: none"> Eliciting feedback loops
Nature of group task	<ul style="list-style-type: none"> Convergent
Time	<p>Preparation time: 5 minutes</p> <p>Time required to complete steps in script: 20 minutes</p> <p>Follow up time: none</p>
Materials needed to complete script	<ul style="list-style-type: none"> Pad of paper to take notes on the model that is being developed
Inputs from other scripts	<ul style="list-style-type: none"> Diagram of a model or map
Outputs from this script	<ul style="list-style-type: none"> List of main feedback loops and dynamics identified List of insights gained from the model
Modeling team roles required and expertise needed	<ul style="list-style-type: none"> Modeler with expertise in system dynamics who is able to quickly stitch together causal linkages to form a feedback model; expertise in using Vensim Recorders who are able to draw causal linkages as they emerge during the discussion Convener
Who is in the room?	<ul style="list-style-type: none"> Participants Core Modeling Team
Steps	<ol style="list-style-type: none"> The modeler takes notes on the key features of the model as it is being built with a focus on highlighting some of the major reinforcing and balancing feedback loops, dynamics, and insights gained during the session. At the start of model review, the modeler moves up to the front of the room. The modeler then reviews the causal map, model, actions, etc. by reading back the stories associated with major positive and balancing feedback loops, intervention points, etc. In a causal diagram, the modeler takes care to explain that a “positive arrow from A to B means that <i>A adds to B or a change in A causes a change in B in the same direction</i>” while a negative link from A to B means that “<i>A subtracts from B, or a change in A causes a change in B in the opposite direction</i>” (Richardson, 1997, p. 249). After the modeler has reviewed the diagram, the facilitator then asks what didn’t get recaptured or is missing from the diagram. The participants will have an opportunity to provide additional input into the model structure and clarify their understanding. The modeler also will point out important changes in structure, help the group identify what is happening with the modeling, and highlight model based insights that emerge.
Evaluation criteria	A causal loop diagram or stock flow diagram that is based on an initial discussion
Author(s)	
History for Script	Based on original script “Causal Mapping from Discussion” by Peter Hovmand, created on April 19, 2010.

Revisions	Revised March 4, 2012 by Meagan Colvin and Peter Hovmand
References	Richardson, G. P. (1997). Problems in causal loop diagrams. <i>System Dynamics Review</i> , 13(3), 247-252.

Action Ideas

Description	Eliciting a list of realistic interventions the group would like to see investigated and analyzed with modeling.
Context	<ul style="list-style-type: none"> • Framing the problem and solutions • Eliciting variables (implicitly, by implication)
Primary nature of group task	Divergent
Time	<p>Preparation: at most 10 minutes for assembling paper, markers, and creating a cross on the board with two axes, low to high impact (horizontal) and easy to hard to implement (vertical)</p> <p>Session: 45 to 60 minutes</p> <p>Follow up: NA</p>
Materials	<ul style="list-style-type: none"> • Markers • 8.5x11 paper • Masking tape for posting on wall • Wall for posting
Inputs	<ul style="list-style-type: none"> • Diagram of a causal map or model
Outputs from this script	<ul style="list-style-type: none"> • List of action ideas
Roles	<ul style="list-style-type: none"> • Facilitator with group experience to lead the exercise • Wall builder to cluster the intervention ideas on the wall and describe the resulting clusters • Modeler to map the actions and where they might impact the system • Recorder to generate a list of action ideas, and whether they are high/low impact or easy/hard to implement
People in the room	<ul style="list-style-type: none"> • All participants in the group model building effort
Steps	<ol style="list-style-type: none"> 1. Working in small groups, the facilitator sets up the task by asking participants to identify action ideas that would impact the system. The facilitator points out that there are different ways to intervene in a system including trying to change a parameter and adding/removing link that is part of a feedback loop. The facilitator can cite the Meadows' (1999) "Leverage points: places to intervene in a system" paper. 2. The facilitator explains that there should only be one action per page and that each action should have a short name (e.g., "Training"), and a brief description of what the action is and where it impacts the system. 3. The facilitator explains that they will have 15 minutes to come up with action ideas. As they develop each action idea, they should also decide how easy or hard the action to implement. 4. As participants near the end of their allotted time, the facilitator asks each group to sort their action ideas from most to least favorite with their favorite idea on top. 5. The facilitator then asks each group to share one action idea in a round robin fashion. The wall builder collects intervention sheets one at a time and clusters them on the graph depending on their impact and feasibility.

	<p>6. The facilitator will encourage participants to identify where in the model structure might this intervention fit and impact. For example, “And where in the model would this action have an impact?” If participants say that the model would impact “everything” or more than three variables or links, ask them to pick their three. The facilitator should also ask follow-up questions on what are the barriers to implementation if an action idea is described as hard.</p> <p>7. Recorders take notes on the idea, description, high versus low impact, and easy versus hard to implement.</p> <p>8. As participants nominate actions, the modeler maps action into the CLD or stock-flow structure based on participants’ descriptions.</p>
Evaluation criteria	<ul style="list-style-type: none"> List of action ideas organized by feasibility of implementation and impact
Authors	Unknown
History	Originally documented Rise, Sister, Rise Community Dialogue, Ohio Department of Mental Health led by Frances Curtis Fazier, President, Women’s Workfco, Inc.
Revisions	Revised March 6, 2012 by Peter Hovmand and Meagan Colvin.
References	Meadows, D. (1999). Leverage points: places to intervene in a system. Hartland, VT: The Sustainability Institute.

Intervention Design Script

Description:	A structured process for using the model to test ideas for intervention
Context:	After a model has been developed, as the participants want to get to action
Purpose of script:	<ul style="list-style-type: none"> Designing effective interventions in the context of the larger system
Primary nature of group task:	<ul style="list-style-type: none"> Convergent
Time:	Preparation time: review the blank worksheet with the participants. Time to complete the script: 45-60 minutes Follow up time: none
Materials:	<ul style="list-style-type: none"> Printed worksheet Printed model Pens/pencils for participants Camera to take pictures of completed worksheets
Inputs:	<ul style="list-style-type: none"> List of actions or potential interventions grounded in a causal diagram or model Causal diagram or model
Outputs from this script:	<ul style="list-style-type: none"> Completed worksheet describing the intervention
Roles:	<ul style="list-style-type: none"> Facilitator familiar with the model and program development Recorder prepared to take notes on each intervention
People in the room:	<ul style="list-style-type: none"> Participants
Steps:	<ol style="list-style-type: none"> The facilitator hands out the diagrams on a large format page, one per group. The facilitator distributes the completed example worksheet, if available, or a blank worksheet, and reviews an example: <ol style="list-style-type: none"> Insert the name of the proposed intervention in the appropriate feedback loop of the model, with the appropriate structure reflecting the intended theory of action of the intervention. Remember to insert polarities. Retrace the feedback loop to examine how the additional structure impacts the model. Pay particular attention to the impact the proposed intervention would have on the model's reference mode and/or key stocks. Break the participants up into small groups (2-4 depending on number of participants or by tables). Have each group repeat the process you just demonstrated (steps 4-6) on an intervention of their choice (20 minutes) Each group reports out, showing the revised model structure. (5 min/group)
Evaluation criteria:	<ol style="list-style-type: none"> Completed worksheet describing the intervention Modified model structure that reflects the proposed intervention
Authors:	Created by Timothy Hower June, 2011
History:	Originally developed as a one-hour workshop for the VTB conference in June, 2011.

Revisions:	Original
References:	Not applicable

Using the Model to Design Interventions Worksheet

Name of Intervention:

Describe the Purpose of your intended change:

Target Population:

Primary Activity of Intervention:

Intended Outcome(s) for target population:

Where does this intervention fit in the larger system?

- *Which Feedback Loop(s) does this primarily impact and how?*
- *What is the intended impact(s) on the system?*
- *Draw the new structure that is implied by complete implementation of your idea*
- *Identify other parts of the system that could be impacted by this idea.*
- *How might the system's natural tendency to remain stable resist your ideas?*
- *What Balancing Loops might arise to limit the effectiveness of your proposal?*
- *What are possible UNINTENDED Consequences of your planned intervention? (Hint – trace the entire feedback loop in which your intervention resides, and ask what might happen if the program works as expected – then ask what happens if it only partially works, or fails.)*
- *Who else needs to be aware of or involved in planning or implementation for this to succeed?*

Debriefing Script

Description	This script is used to organize the Team’s debriefing session after a GMB session.
Context	May be used after each GMB session.
Purpose(s)	<ul style="list-style-type: none"> • Capturing salient aspects of the GMB session to accelerate learning and improvement.
Nature of group task	<ul style="list-style-type: none"> • Evaluative: activity designed to evaluate and choose between options and ideas
Time	<p>Preparation time: None</p> <p>Time required to complete steps: 30 minutes, depending on complexity</p> <p>Follow up time: None</p>
Materials needed to complete script	<ul style="list-style-type: none"> • Chairs in a circle
Inputs from other scripts	<ul style="list-style-type: none"> • Final, detailed version of the Script from GMB session being debriefed
Outputs from this script	<ul style="list-style-type: none"> • Completed Evaluation instrument(s) • Completed Debriefing Worksheet • List of actions necessary to implement improvements
Who is in the room?	<ul style="list-style-type: none"> • All Core Modeling Team members who participated in session under review
Steps	<ol style="list-style-type: none"> 1. Assemble the Core Modeling Team, announce the start of the Debrief 2. Debriefing reviews the process the team will use to conduct the review 3. Begin with a check-in to see how people are doing. This is important regardless of whether the session went well or badly. 4. Ask the following questions: <ul style="list-style-type: none"> • How are you feeling about how this GMB session went? • Overall, did we accomplish what the session was designed to do? • What went well during this session? Specifically, what did we do that contributed to the creation of value for the participants? (each member of the GMB session team should offer a specific example of something that went well) • From your perspective, what would have led to even more value creation for participants? • Were there any rough parts for you? (All should have the opportunity to answer, but not all need to comment) • What did you learn from this session? (all answer) • What specific, actionable steps can we take to solidify this learning and improve the way we work?
Evaluation criteria	<ol style="list-style-type: none"> 1. Stronger, more cohesive team after the debrief 2. List of ways to improve the process.
Author(s)	Timothy Hower (thower@wustl.edu) and Peter Hovmand (phovmand@wustl.edu) , April 6, 2010
History of Script	Original Script based on current practice and author’s work.

Revisions	Revised March 1, 2012 for Systems Thinking in Schools GMB Sessions
References	--