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Abstract:	The article describes how logic models are used to teach critical thinking in social work courses. Logic models are constructs of concise, carefully worded statements that together provide a comprehensive cognitive structure of a change process, whether it be a program or a clinical intervention. The statements focus on the targets, means, and ends of a purposeful intervention. A logic model specifies that, given a problem or need which is recognized and deemed solvable, there must be a concrete goal. Logic modeling may seem a merely mechanical exercise, although it is quite complex. To help students initially gain a basic understanding of logic modeling , a simple logic model that has seven elements, namely, problem or need, goal, objectives, inputs, methods, results and outcomes, linked together in a logical chain, has been provided. To further the understanding, a complex logic model format with the three objectives of problem, goal and outcomes, has also been described. One unique aspect of logic modeling, and one that can be useful for social work, is that causal chains can be constructed to span multiple levels. Various modeling interventions across multiple levels have been represented.

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LOGIC MODELING: A TOOL FOR TEACHING CRITICAL THINKING IN SOCIAL WORK PRACTICE

This article describes how logic models are used to teach critical thinking in social work courses. By breaking down the helping process into parts, logic modeling enables students to think about the clinical experience as a whole and to understand the causal relationships between these parts. Students are exposed to the connections between social work theory and practice, and they are made aware of the reciprocal connections between interventions and outcomes at the individual, organizational, community, and societal levels. The discussion of logic models in social work education is continued in the following article as well.

Social work educators must provide students with the tools to think critically and to apply empirical knowledge they learn in the classroom to social work practice (Cossum, 1994; Kirk & Rosenblatt, 1981). Because effective professional practice, now more than ever, demands the ability to reason and make effective decisions, social workers must be able to:

break down and analyze social problems;

draw on theories of human and organizational behavior to understand the underlying and interacting antecedents of social problems;

generate alternative strategies, methods, and interventions to create change; and

use empirical evidence of effectiveness when selecting among alternative interventions.

To put it rather negatively, social work educators should strive to prevent their students from committing the mistakes of paraprofessionals unacquainted with the principles of the scientific method. Such practitioners often use methods without examining the causal relationship between their intervention and the results they expect to obtain; they may generalize to large populations from case studies or inadequate samples; and they may attribute client change to their intervention without acknowledging other possible explanations (Meyers, 1986; Seelig, 1991).

For example, we have observed over many years of teaching that students usually perceive most social problems as the lack of a specific formal social service. Thus they have a stock response to most human difficulties: "the client needs counseling... case management... family therapy." Students also want a list of "to do/to say" formulas (Goldstein, 1993). For a child with untreated health problems, students immediately diagnose a case of medical neglect (without sufficient information) and prescribe parenting classes. For a mother of three on welfare for eight years, they jump to the conclusion that she lacks self-esteem and, as the first service to be provided, refer her to assertiveness training. These interventions might be helpful, but students too often plan to treat the wrong problem first (or at least not the most important problem). They also develop plans that use only formal services, not informal resources mobilized from their clients' environment (Gibbs, 1994). Many students find it difficult to invent strategies that are congruent with the perceived problem. Rather, their responses are too often restricted to their own practice experience or to the services provided by their agencies.

Cognitive psychologists have argued that practice judgment is a more difficult task than previously thought. In his review of the literature, Arkes (1981) discusses four impediments to accurate judgment: inability to conceptualize multivariate causes and covariation; influence of preconceived notions; over-confidence (even in the face of contrary data); and hindsight bias. Perhaps the most serious hindrance is that most social workers do not know what actually influences their judgment (Arkes, 1981; Gauron & Dickinson, 1966; Goldstein, 1993), and they do not know that they do not know (Schon,

1983).

In helping students overcome these impediments, instructors often focus on skills that enable students to make explicit their unconscious practice assumptions and theories, as well as to consider alternative explanations and innovative solutions. We fear, however, that social work educators too often assume that students develop the capacity for critical thought automatically, somehow absorbing critical thinking skills as they progress through their education (Seelig, 1991). However, the contrary is the case. Research shows that simply having knowledge about scientific methods and processes does not guarantee that students will apply critical reasoning to practice (Beck, Bennett, McLeod, & Molyneaux, 1992; Comier & Hagman, 1987; Rosenblatt & Kirk, 1981). Rather, learning transfer requires that educators see critical thinking as a discrete skill that must be taught in the classroom (Gambrill, 1994; Larkin, 1989; Meyers, 1986; Seelig, 1991).

We believe an emphasis on critical thinking skills will help counteract some of students' unproductive and ineffective thinking. In this context, critical thinking applies to the careful and exact cognitive processes needed to construct logical interventions and program hypotheses. This entails the ability to dismantle a perceived problem/need and goal into constituent parts (analytic thinking), the ability to identify patterns of relationships among interdependent parts and systems (systemic thinking), the ability to envision many alternative choices and solutions (creative thinking), and the ability to specify one's theory of action (reflective thinking). Although the merits of critical thinking have been discussed in the literature in recent years, few concrete strategies or techniques have been suggested to enable educators to incorporate this skill development into their courses. (For a set of excellent techniques, see Gibbs & Gambrill, 1996, and Gibbs et al., 1995; for the use of narrative approach, see Noer, 1994.)

One method used in teaching critical thinking over the past decade is logic modeling. The term, also called program modeling, refers to a process of social work planning, while logic model refers to the standardized, structured output of this process. We have found logic modeling useful in practice courses and as an analytic tool in research and policy courses. We believe the time and energy needed to teach logic modeling is worthwhile because it: (a) enables the application of critical thinking to assessment, intervention planning, and evaluation at the individual, organizational, and community level; (b) makes explicit the reciprocal connections among practice, program, and policy; and (c) makes clear the connections between theories of human behavior and social interventions. For students to understand social work activity in tended to produce change, they must first be able to explain the underlying logic of the action and outcome--the causal relationships that constitute the hypothesis of the intervention or program. Identifying and explaining the assumptions about the cause and effect of a proposed change process is the first step of planning and assessment, and it is made much easier by a comprehensive logic model.

At first glance, logic modeling may seem to be an offshoot of the problem solving model (Compton & Galaway, 1984) and/or the task-centered approach (Tolson, Reid, & Garvin, 1994). It is not, however, a model of social work practice per se; logic modeling is a process of planning for purposive change. It is a structured way to plan an intervention and evaluation that can encompass one or more theories of practice. Developed from systems analysis, it is a planning process that, in general terms, requires

users to differentiate ends (goals and objectives) from means (methods), consider alternative means for achieving the ends, and then specify the theory that explains how the ends will be met.

We emphasize planning process for several reasons. First, when practitioners and researchers use logic modeling, they always go through the process with others (e.g., a client, family, planning committee, or community task force). Second, although planning has to be replaced with implementation at some point, a logic model is not a static document, but a blueprint against which actions and results can be measured. With a client or community group, it becomes a means for deciding when expectations are not being realized and alternatives have to be reconsidered. Third, and most important, logic modeling surpasses the ideas contained in the classic models of social work because it can be used in multi-systemic practice--that is, it can encompass simultaneous or sequential interventions at multiple levels.

This article describes logic modeling as a tool for teaching critical thinking across the social work curriculum in practice, research, and policy courses. We define the seven elements that are the model's building blocks, and we illustrate each element in two concrete logic models--one developed for an individual client and one for a program. The article concludes with a discussion of how logic modeling can be used to plan multi-systemic interventions.

Creating and Teaching Logic Models
Basic Structures

Logic models are constructs of concise, carefully worded statements that together provide a comprehensive cognitive structure of a change process, whether it be a program or a clinical intervention. The statements focus on the targets, means, and ends of a purposeful intervention. A logic model specifies that, given a problem or need which is recognized and deemed solvable, there must be a concrete goal. To accomplish the overall goal, objectives or "minigoals" must be met and, given these objectives, there are resources--inputs and processes/methods-that must be obtained and implemented. If these resources are available and operational, there will be intervention results in the short term and outcomes in the long term.

Logic modeling may seem a merely mechanical exercise. In fact, when a careful and thoughtful approach is taken, a finished logic model (like those in Figures 3 through 5) can take many hours or even days to process, depending on its complexity. To help students initially gain a basic understanding, we start with a simplified logic model that has seven elements linked together in a logical chain.

Figure 1 illustrates a basic linear model with feedback that develops a simple hypothesis: given a stated problem, goal, and objective, if we apply specified resources and processes, then we can expect a certain short-term result(s) and a certain long-term outcome(s) that, in turn, might help us redefine our problem. Students need to understand this basic model before moving on to more complex models.

Such simple models are seldom encountered, however, because the problem and goal are often so far-reaching that multiple planned interventions must be accomplished. The goal must therefore be broken down into incremental steps, each needing a unique set of inputs and processes, and each producing different results. We thus expect that these multiple results are all needed to achieve the

desired long-term outcome(s). A complex model is shown in Figure 2. Taken together, these multiple elements constitute a causal chain that is linked horizontally and vertically. This complex logic model makes explicit two sets of program hypotheses. The elements linking the horizontal plane explicate the relationship between resources, activities, and impacts/outcomes; the elements linked and stacked horizontally form hypotheses that explain power and resource relationships.

After practicing critical thinking skills in the classroom via logic modeling exercises and homework assignments, students should be able to articulate a clear cognitive understanding of an intervention's purpose, expected results, and outcomes; to justify these results in terms of an explicit theory; and to define the interaction among the expected results. Without this understanding, they will find it very difficult to take the next step--designing an assessment or evaluation. Two case studies are used in this article to illustrate the process of logic model design, and the article that follows this one discusses the use of logic models in practice evaluation.

It is important to point out that the sequence of steps does not have to follow those shown in Figure 1. In a normative planning process, for example, one might start with the goal statement rather than the problem statement and work backward (Gilbert & Specht, 1977). Alternatively, one might start with the results of a case assessment or program evaluation and ask what problems or deficiencies are identified and what new direction is suggested. In other words, the logic modeling process can be entered at any point in the cycle. As a teaching strategy, however, students probably find modeling more understandable by beginning with an analysis of the problem.

Moreover, in learning logic modeling as a planning process, students should be aware that the elements are often revised numerous times as the model's hypothesis is tested. This is because the elements of the model, despite their linearity on paper, foster recursive reflection (Schon, 1983, 1987). That is, the flow of the model should direct students and practitioners to consider all the possible methods that could reasonably be expected to achieve the desired results and outcomes. If, after implementation, the results are not as expected, then the planning process should be repeated in light of this new knowledge, and the objectives and methods revised. Assessment thus becomes an ongoing process that often leads to the refinement of objectives and methods (Meyers, 1986). Educators should emphasize that the model assumes a spiral-like process whereby knowledge gained about outcomes is fed back into the next planning process, which produces a revised and improved model.

Defining the Problem
Conceptualizing the problem is the most important part of a planning process. From it grow the goals, methods, and implementation plan (Meyers, 1986). If the problem is wrongly diagnosed, everything that flows from it will be wrong. In designing a logic model, this stage can be completed by creating a problem statement. This statement refers to a current condition perceived as harmful or inadequate; as such it is a description of "what is" (see Figure 1). It is a comprehensive description of the environment, resources, characteristics, behaviors, attitudes, or attributes of a person, organization, or population that for some reason must be changed. Problem statements should answer these questions: What problematic condition exists? Why does it exist? For whom is this a problem (an individual or family, a population of individuals or families, a community, a state, or a society in general)?

Inexperienced social workers and students often think that problem statements are easy to write, and

then they fall into one of several traps. The most common is to frame the problem as a "need," where the need is a service or program. This is a trap because it precludes any real discussion about the nature of the problem in terms of the lives of those experiencing it. Framing the problem as the need for a service creates circular reasoning, because the hypothesis starts with (the lack of) a service and ends with (the presence of) a service. In social work, we should justify the provision of services in terms of people's needs, wants, and desires. Unfortunately, if the perceived problem is that a particular service does not exist and is "needed," then the immediate reaction and subsequent goal is to create the service; the method thus becomes the development of the service; and the only evaluation question is whether such a service previously existed. Nowhere in this set of statements would there be an exploration of the question, "Why is this a problem and for whom?"

Students also seem to have difficulty using theory to assess problems (Meyers, 1986). One way to teach this integration is to require students to ask and answer the question, "Why is this a problem?" To answer, they must use a theory to explain the person's (or group's, organization's, community's) situation or behavior. Sometimes, because the question does not get far enough into the theoretical causal chain, students have to ask it again. We agree with Fonteyn (1991) that integrating explanatory theory into everyday casework or organizational planning is the most important of the critical thinking skills.

To avoid these traps, educators might ask students to analyze problems fully before they write problem statements, and they might stress that the statements should be as detailed and descriptive as possible. The more comprehensive a problem statement, the easier it is to write the objectives that must flow from it. To write a useful problem statement, students must be grounded in the lives of the people who are affected by the problem, and must express the statement in human terms.

The two models illustrated here are interventions developed by an agency staff for an individual case (Gloria) and for a program (the Economic Self-Sufficiency Program). They are the product of a great deal of information processing to select the most relevant data, and the staff considered many alternative statements of the problems, goals, objectives, resources, results, and outcomes. From their analyses, they developed problem statements for both examples.

Problem Statement for Gloria's Case

Gloria is a 23-year-old Caucasian mother of two sons, ages 2 1/2 and 4 years. She has received Aid to Families with Dependent Children (AFDC) since the birth of her first child. The family resides in the same apartment building as Gloria's mother, Alice--her only living relative. Gloria says she wants very much to become self-sufficient. She wants to learn word processing in order to get a good secretarial job. However, Alice criticizes these wishes loudly and frequently; she accuses Gloria of being a bad mother and being "uppity" for wanting to go to school. Alice refuses to baby-sit for her grandchildren at any time when Gloria might explore or advance her educational/career goals. The 2 1/2-year-old cries if Gloria leaves the home, and the 4-year-old has been regressing in regard to toilet training. Gloria says she is giving up; she is sleeping during the day a great deal.

Problem breakdown:

Gloria feels guilty about her desires and is displaying early symptoms of depression.

The family stress is increasing and having negative effects on the children.

Gloria doesn't have information about training or educational programs for word processing.

Gloria lacks any alternatives for child care.

Gloria needs funding/resources; she needs to explore sources for tuition and transportation costs.

Problem Statement for Economic Self-Sufficiency Program (ESP) Plan

In our county, 36,259 parents are currently receiving public assistance (AFDC, food stamps, Medicaid, subsidized housing) or are adults (without children) living below the poverty line. This represents 19% of the state's families. The total unemployment rate for 1997 is forecast to be 6.5%, with the rate for African Americans predicted to be twice the overall rate. Individuals and heads of households face many barriers when trying to achieve economic self-sufficiency, and there are major disincentives that keep families relying on public assistance unnecessarily.

Problem breakdown:

There are very few new jobs being created in our county. A few pay sufficiently high wages, but unemployed individuals usually do not have (1) the education or job skills necessary to obtain these jobs, and (2) the child care and transportation necessary to take advantage of the educational programs that are available.

Other available jobs pay minimum wage; they do not enable families to be self-sufficient and do not provide health care insurance. For parents with young families, it is clearly not in their best interests to take low-paying jobs, because their earnings go above the poverty line and they lose their Medicaid benefits.

Setting Goals

Goal statements are the second most important part of a planning process. They refer to a future condition perceived as desirable and feasible and that will solve or ameliorate the stated problem. If the problem statement defines "what is," the goal statement defines "what should be."

The thrust of a goal statement should be broad, much like a mission statement. Goal statements should be as far-reaching as possible and still be obtainable within a reasonable amount of time, given the level of resources that can be brought to bear on the problem. Like the problem statement, goals should be considered from the consumer's point of view, and should represent a future condition sought by the client or consumer. Goal statements should state what outcome is desired for each component (written in the present or future tense), whoor what is to be affected, how they will be affected, and when and where they will be affected.

The most common error made by students when first writing goal statements is the tendency to write goals that are unconnected to the problem being addressed. Often, this leads to a goal that is only the absence of the problem, when ideally it should put the subject or victim of the problem in a different place, situation, or experience.

It is also very common to have students indicate goals as follows: "to provide training services," "to assist Margaret Brown in developing better coping skills," or "to initiate a chore service for elderly residents of our city." In logic modeling, these are not goal statements because they describe a process and, thus, are really method statements. Some students, especially social work students, find it difficult to disentangle methods from goals--means from ends. Perhaps this is because goals are

abstractions of something that does not exist, and it takes creative thinking and ingenuity to create a reality that is worth working for and attainable. It is also true that many social workers, especially those with prior agency experience, have had little opportunity to design goals; too often they work in programs where the goals and even the methods are prescribed in very concrete and definitive ways. Students should be encouraged to "put themselves in the shoes" of those experiencing the problem and to imagine alternative scenarios where the problem does not exist. One way to do this is to make them ask, "If this is the problem, then what would the worldlook like for this person or this population if the problem did not exist?"

Goal Statement in Gloria's Case Plan

Gloria has the resources she requires to enter school and complete her education and training; there are no external barriers to her advancing her career goals. Gloria also has the support of family members and friends in pursuing her career goals and her movement toward self-sufficiency.

Goal Statement in ESP Plan

Low-income individuals and families in the state are able to pursue their educational and job training goals, and no policies within the public assistance system exist to act as barriers or disincentives to their movement toward self-sufficiency.

Affixing Objectives

If objectives are to be clearly understood and ultimately evaluated, then care must be taken to write them as if they were minigoals. For example, we might write statements such as "Gloria's objective is to develop self-confidence." In this sentence, the infinitive "to develop" denotes a process that occurs across time and has properties, such as duration, which can be measured, but is happening continuously. Practitioners might decide that "self-confidence" is the real objective, but aside from asking whether or not it actually developed (a dichotomous variable), they do not know much about it.

Objectives are more useful when they are conceived as steps that must be accomplished if the goal is to be achieved. Objectives are components of the goal that are more limited in scope, less abstract, more concrete, and thus measurable. When logic modeling is used in planning, the objectives are statements that describe the results of the plan's components. For example, if the flow of children into and through a residential treatment center is designed so that the total program encompasses (a) intake, (b) assessment, (c) treatment (which in turn can be broken down into different types of therapies), (d) discharge, and (e) follow-up, then the logic model would have objectives for each of these components. When the model is applied to an individual case plan, then the components can be similarly described as (a) joining, (b) individual/family assessment, (c) intervention, (d) monitoring, (e) termination, and (f) follow-up. It is also possible to break objectives down into minute steps or phases, where each is written at the level of a discrete task. The degree of breakdown depends on the context of the modeling and the nature of the specific intervention or program.

Goals are abstract, but objectives should be as concrete as possible. Like goals, however, they state what outcome is desired for each component (written in the present or future tense), who or what is to be affected, how they will be affected, and when and where they will be affected. In addition, objectives should always be written from the recipient's or target population's point of view.

Objectives of Gloria's Case Plan

Gloria achieves her personal goals and gains self-sufficiency by completing the objectives listed below. (They also appear in abbreviated form in Figure 3.)

(1) Gloria feels empowered and supported regarding her educational/ training goals and as a parent.

(2) Gloria increases her awareness of educational and training resources in her community, improves her ability to use the application process, and understands the responsibilities inherent in educational loans.

(3) Gloria develops a higher level of self-knowledge, is able to become more self-directed, selects an educational program that matches her skills and interests, and focuses her energies and resources on the admissions process.

(4) Gloria increases her awareness that there are many other single women enrolled in the community college, seeks out information about services that support single parents, and networks with other single parents in mutually beneficial relationships.

(5) Gloria assesses the day care options available to her, chooses the one she believes is best suited to her children's needs, enrolls her children, and after six months believes that they have suffered no additional stress as a result of attending day care.

Objectives of ESP Plan

Single individuals and those with families achieve their career goals and move toward economic self-sufficiency via one of three pathways. (The objectives of the third pathway, the self-employment pathway, are listed below and in Figure 4.)

(1) They obtain jobs that provide opportunities for on-the-job training.

(2) They obtain college or technical degrees that qualify them for jobs paying enough to move them to economic self-sufficiency within two years.

(3) They become self-employed through businesses that they start themselves and that are able to support their families two years after start-up. Participants who choose the self-employment pathway (a) have adequate information, (b) complete self-assessments and plans, (c) write high-quality business plans, (d) apply for and acquire business loans when needed, and, as a re-suit of these activities, (e) are successful in starting small businesses.

Developing Inputs and Methods

The next elements of a logic model specify the means by which the goals and objectives will be achieved. Means are all the things used and managed in the process of working toward expected short-term results and long-term outcomes. These statements describe what tangible and intangible resources are needed and what activities must be brought to bear on the resources in order to accomplish the objectives.

Means are often categorized as either inputs or methods. Inputs are the raw materials required by the

change process; some of the inputs usually needed are clients or participants, personnel with specific knowledge or training, financial resources, physical facilities and equipment, time and commitment from persons in leadership roles, legitimacy and community sanction, and the willingness of similar organizations to collaborate or coordinate efforts. Methods are the processes applied to the resources to produce the desired result(s). Some of the methods often used are counseling, psychosocial therapies, outreach, information and referral, and interagency teams, to name only a few.

At this point in logic modeling, most students finally feel comfortable. Almost all can readily describe one or more social work methods. The challenge to educators, however, is to push students to think creatively--to think of all the alternative means of accomplishing what is needed, rather than the method that first comes to mind. There are always unconventional, innovative, and neighborhood-based alternatives to formal social services, but it usually takes time and the exploration of options before students grab onto this idea. When all of the options are laid out, they should be considered within a theoretical context.

This, then, is the second challenge: to enable students to justify their choice of method either by citing empirical studies that provide evidence of their method's effectiveness, or, for an innovative intervention, in terms of a theoretical framework yet to be tested. Perhaps we err in taking a justification rather than a falsification approach to knowledge building, but at least we encourage students to look for empirical evidence that supports all the options and to choose one based on the data that they have. To ask them to construct a null hypothesis about the linkages would probably make the planning process unmanageable. We believe, however, that students in practice courses should be taught the difference between the justification and falsification approaches both as theories and in their application in practice and research.

Some students find it exceedingly difficult to specify a theory to explain their choice of method. In these cases it can be helpful to identify theoretical perspectives commonly relied upon by social workers: in direct practice, students might draw from family systems, brief therapy, problem solving, cognitive, psychosocial, social learning, radical social work, and life span development theories. In indirect practice, there are resource dependency, power, rational choice, contingency, sociotechnical, exchange, interorganizational relationships, and small group dynamics theories for students to refer to.

Inputs and methods can be combined into single statements (as they are below), or they can be broken down into separate statements. Each program or intervention component, however, must have individual statements included in the model. Input and method statements are written in the voice of the social worker or organization (or consortium of organizations, communities, or even nations) and make explicit who is responsible for doing the process, what they do and what resources they use, and by when they should have it done. Input and method statements can vary considerably in the amount of detail included; below are brief examples. (Note that in Gloria's case, the inputs and methods correspond to all objectives, while for ESP they apply only to Objective 3.)

Inputs & Methods in Gloria's Case Plan
(1) Family-Centered Casework. Inputs include a social worker trained in family-centered practice with time for intensive interventions with all family members and an educational resource directory. Methods: a social worker completes a comprehensive psychosocial assessment of Gloria and her

family (including strengths, resources, and stressors); provides information and referral to educational resources in the community; teaches Gloria how to access and utilize services; and engages Gloria in supportive, short-term counseling.

(2) Education and Training. Inputs include a local community college degree program, an educational/career adviser, and information on tuition grant programs. Methods: educational evaluation is conducted at Jones County Community College; educational evaluation is utilized by adviser to help Gloria plan her career training; and assistance is found for Gloria in the application process for an educational/training program and for financial aid through the state Jobs program.

(3) Support Services. Inputs include a daycare staff, single-parent student support group, transportation, and telephone. Methods: a social worker links Gloria to a single-parent student support group; social worker links Gloria to a daycare center at Gloria's educational facility; daycare worker joins with Gloria in exploration of daycare facilities/resources; social worker monitors educational assessment and application process, daycare application and utilization process, and attendance and effect of support group membership.

(4) Family Development and Support. Inputs include an informal network of friends for Alice and city support for urban gardening project. Methods: a social worker encourages other women in apartment complex to make friends with Alice; links them with city program planner to develop urban gardening project for their apartment complex; and encourages Alice to support Gloria in her goals.

Inputs & Methods for Objective 3 in ESP Plan

(3a) Outreach and Orientation. Inputs: collaboration and public relations. Methods: every month, starting January 1997, ESP invites low-income individuals and those on AFDC to attend a day-long orientation meeting. Outreach is intensive and uses advertising, public relations, and direct mail to attract as many individuals as possible.

(3b) Assessment and Referral. Inputs: assessment materials, staff trained in assessment, and referral agreements. Methods: Individuals are invited to another day-long session to complete a personal assessment. They learn the level of education and training necessary to pursue the career that interests them, and they assess their willingness and ability to prepare for their chosen career. They can elect to receive a referral for job finding or for education, or they can enter the ESP business training program, which leads to self-employment.

(3c, d) Technical Assistance (TA). Inputs: bank loan pools, friendly bank officers, and TA skills. Methods: ESP staff to provide TA. To those who need startup capital, ESP staff provide assistance in applying for bank loans. They also provide TA to participants who start a business, such as training in operational skills like cash flow and personnel management.

(3e) Follow-Up. Inputs: staff with time for follow-up. Methods: ESP staff follow up with each start-up after one year and two years to determine participants' status and current needs.

Analyzing Results and Outcomes

It helps in many situations to differentiate between short-term results of an intervention or action and

the longer-term outcomes that require follow up, because clinical workers and programs often have the capability of assessing the first but not the second. A careful statement about the intermediate results of the intervention often provides the basis for the only feasible evaluation design.

Giving students simple examples from other fields to illustrate the difference between intermediate results and longer-term outcomes can be useful. For example, the intermediate result of an assembly line is a car (the output), while the long-term effect is air pollution (the outcome). Intermediate results refer to observable changes in the clients; they are the measurable and verifiable accomplishments of the intervention as the client exits the program or as the activity ceases. They are written in the present or future tense.

Intermediate Results of Gloria's Case Plan

Within 3 months:

Gloria is engaged in counseling.

Gloria attends all counseling appointments.

Gloria's image of herself changes.

Gloria perceives herself as 30% more personally effective.

A family and ecological systems assessment is completed.

Gloria's family does at least one recreation activity together each week.

Gloria's educational evaluation is completed.

Gloria is energized to pursue her goals.

Gloria increases her knowledge about available resources and learns to ask for assistance.

Gloria contacts 90% of resources to which she is referred.

Gloria describes herself as a good parent at least 50% of the time.

Alice's urban garden group meets weekly.

The city supports development of an urban garden.

Alice complains to Gloria less than two times a week.

Within 6 months:

Gloria will complete one semester's worth of courses.

Grade reports evidence that Gloria is succeeding in her educational/ training program with a grade of "B" or better.

Gloria rates herself as a good mother 80% of the time over the next year.

By the end of six months after beginning day care, the day care staff report that on the Denver Developmental Test Gloria's children are at or above the age-appropriate level.

Within six months of beginning her educational/training program, Gloria reports that her mother's complaints about her educational and daycare program have ceased, and that occasional criticism does not bother her.

Intermediate Results of ESP Plan (Based on Objective 3)

Over a three-year period:

10,000 low-income individuals receive direct mail through the AFDC program telling them about ESP;

25,000 hear about it on radio, television, or in various print media;

560 attend an orientation meeting;

560 attendees have comprehensive knowledge about the job market.

Of the 420 low-income individuals who attend ESP assessment workshops:

All understand the criteria for entry into their chosen career path;

20% accept a referral to receive job-finding and job-placement services;

40% accept a referral for placement in an educational program;

40% enroll in ESP's business training.

Of the 120 ESP participants who complete business training:

all demonstrate improvement in their time management and personal financial management;

all perceive themselves to have greater self-confidence;

all have comprehensive knowledge of how to complete a loan application;

100 finish a business plan that is judged by trainers to be moderate to high in quality.

80 complete loan applications that are judged by loan officers to be well developed and competently written;

60 acquire business loans;

75 start small businesses.

Of all participants who attend the assessment workshop, one year after exiting ESP:

50 remain in the jobs in which they were placed;

100 complete (or will complete) educational degree programs;

70 who started small businesses are still in business.

Longer-term outcomes, on the other hand, are the changes that are expected some time after the program or intervention has ceased. They are external to the worker or program, and their measurement in most cases requires following clients wherever they might go. Outcome assessment thus might require ingenious methods to access the information needed for the assessment.

Outcomes of Gloria's Case Plan

Two years after beginning the word-processing educational/training program, Gloria has graduated with honors, acquired a job as a word processor, and will receive her mother's admiration regarding her educational and career achievements.

Outcomes of ESP Plan

Two years after exiting the ESP Program, participants who are AFDC recipients achieve self-sufficiency more quickly and in greater numbers than a comparison group of matched recipients who do not participate in the ESP program. The difference between the percentage of the ESP group who are self-sufficient compared with the percentage of the comparison group is expected to be greater than 15 percentage points, a statistically significant difference.

As students progress, they will be able to put the elements of a logic model into a flow chart that graphs the relationships among all the elements. More complex logic models benefit from being graphed so that interrelationships between horizontal and vertical elements can be made explicit. Figures 3 and 4 show flow charts of the micro and macro logic models given above.

Modeling Interventions Across Multiple Levels

One unique aspect of logic modeling, and one that can be useful for social work, is that causal chains can be constructed to span multiple levels. It is rare today to develop a program or intervention that does not require for its successful implementation one or more changes at a more general level--be it in the structure, administration, or resources of the sponsoring organization, or in the policies formulated by state or federal agencies.

When services to individuals or families require multisystemic interventions, then logic models provide the means for describing these complex causal relationships. Elements are written for each level that is the target of intervention, thus charting the change process across multiple levels. In the systems perspective, this strategy is necessary to deal with the problem of isomorphism: a situation where similar structures exist at adjacent levels, often producing similar adverse conditions.

For example, if a social worker is working with an adolescent boy in the juvenile justice system and finds that his family's fragmentation and economic deprivation contribute to his problem, the practitioner might also find that the family's neighborhood is served by a service system that exhibits similarly poor structures and resources. If so, then interventions can be designed to make changes in the boy's behavior as well as in the behavior and resources of larger systems (Imber-Black, 1988). In generalist social work practice, practitioners must recognize that overcoming isomorphism requires parallel processes. In other words, a person-in-environment perspective suggests that solutions at one level often require interventions at other levels. Perhaps the greatest value of logic modeling lies in its ability to help conceptualize and operationalize the linkage between change at the policy level and change at subsystem levels, including state, community, neighborhood, family, and individual levels.

The application of logic modeling to multisystemic practice is illustrated in Figure 5, which shows an enhanced version of the ESP model from Figure 4 that includes the necessary processes at the community and state levels for the program outcomes to be accomplished. In this model, the organizational level has been condensed to make room for interventions at the state and community level. As can be seen, logic modeling is a kind of shorthand that enables complex relationships and ideas (e.g., parallel processes, multisystemic interventions) to be condensed so that whole plans, even very detailed ones, can be viewed on one page.

Students in advanced generalist concentrations particularly benefit from taking an intervention at any level (individual, organization, community, or state/federal) and working up (or down) the hierarchy of levels, thinking of what changes are needed at what levels to accomplish different goals.

Logic Modeling as a Teaching Technique

There are many ways for instructors to use logic modeling as a tool for teaching critical thinking. One effective method is for the instructor to set up the classroom as if it were a planning session in an agency (case planning or program planning), with the students as staff and the instructor as the facilitator (either clinical consultant or program planner). Working together through the elements of the model for each level familiarizes students with the cognitive processes necessary for understanding the links between each element. If there is a skillful facilitator, this exercise demonstrates how modeling processes can be used as an effective planning tool in the context of case planning, or in an agency or community coalition. Students then can practice playing the role of facilitator in small groups, where each is given one element-perhaps the problem statement--and the group completes the model. This

process gives students experience in working through a planning process as a member of a team, which, in our experience, is the way much planning is accomplished today.

Requiring students to complete logic models beginning with the client level and continuing with assignments at the agency and interagency levels also gives students a better understanding of the multiple layers within which clients are embedded and the need for parallel intervention processes.

Summary

Logic modeling is a classroom technique that can help students think critically about social work practice. It enables students and practitioners to organize what are often vague and diffuse ideas about why we intervene, with whom, and to what end. Logic modeling is especially important to practice courses, because rather than simply to accumulate facts, students are asked to organize their ideas about practice into concise statements that, taken together, are hypotheses which can be tested and replicated. The following article continues this discussion, showing how logic modeling can be used to teach practice evaluation.

Figure 1. The Seven Basic Elements of a Logic Model

```
Problem/Need
The current situation; what needs changing; "what is."


Goal
The desired state to be achieved; "what should be."


Objectives
Milestones or minigoals that lead to goal achievement.


Inputs
Concrete and intangible resources needed to achieve the objectives.


Methods
Methods and activities that put resources into operation.


Results
Short-term impact(s) of applying inputs and methods


Outcomes
Long-term impacts of applying inputs and methods.
```
DIAGRAM: Figure 2. A Complex Logic Model Format with Three Objectives. (This Diagram cannot be represented in ASCII text).

Figure 3. Abbreviated Logic Model of Gloria's Case Plan

Problem: Gloria and her family are experiencing psychosocial and ecological distress and barriers preventing them from functioning adaptively and being economically self-sufficient.

Goal: Gloria has the resources and supports she requires to enter school and complete her education,

and there are no barriers to advancing her career goals not to moving toward self-sufficiency.

```
Legend for Chart:


A - Objectives
B - Inputs
C - Methods
D - Results


A
          B
          C
          D


(1) Gloria feels empowered and supported by her social workers and
children.


          * Social worker
          * Comprehensive assessment materials
          * Education Resource Guide
          * Transportation


          *Joining
          * Engagement
          * Eco-assessment
          * Supportive counseling
          * Journaling
          * Information and referral


          Gloria:
          * completes assessment forms
          * contacts 90% of referrals
          * attends all appts.
          Gloria increases:
          * self-efficacy
          * parental efficacy


(2) Gloria is aware of community education resources and financial
aid resources.


          *Community College
          * Educational adviser
          * Grant information
```

```
            * Transportation

            * Educational and career evaluation
            * Financial guidance and counseling

            Gloria:
            * Completes evaluation
            * Prioritizes resources
            * Sends out letters requesting application forms

(3) Gloria is goal directed and organized, and makes decisions
about educational program of her choice.

            * Educational program
            * Openings for admission in program
            * Application forms
            * Transportation

            * Admissions process and guidance
            * Follow-up from social worker

            Gloria:
            * Completes application forms
            * Returns acceptance promptly
            * Registers for first semester
            * Obtains 3.0 GPA

(4) Gloria is aware of and utilizes single-parent group and other
student support.

            * Single-parent/student group
            * Peer support
            * Transportation

            * Linkage with support group
            * Joining and encouragement
            * Monitoring

            Gloria:
            * attends 80% of group meetings
            Gloria feels more:
            * self-confident
            * socially competent
```

```
(5) Gloria uses day care, and children evidence no undue stress.

         * Day care facilities
         * Experienced day care staff
         * Child behavior assessment tools
         * Transportation

         * Information
         * Support and encouragement for Gloria
         * Assessment of children
         * Evaluation and monitoring

         * Gloria completes applications
         * Children's behavior within normative range
         * Symptomatic behaviors reduced
```

Outcome: Gloria graduates, obtains a job, a nurturing family, and alice's praise and admiration

Figure 4. Abbreviated Logic Model of Economic Self-Sufficiency Program (ESP) Plan

Problem: 19% of the state's population is officially poor and face many barriers when trying to achieve economic self-sufficiency: low-paying jobs, lack of support services that would enable them to complete school so they can qualify for high-paying jobs, anti the loss of Medicaid benefits if they go even slightly over the poverty line.

Goal: Low-income individuals and families who wish to move toward self-sufficiency encounter no barriers which impede their progress; they have adequate concrete and social support; and they can acquire the knowledge and skills they want and need.

```
Legend for Chart:

A - Objectives
B - Inputs
C - Methods
D - Results


A
         B
         C
         D


(3a) Low-income individuals are made aware of ESP and have timely
information about the program.

         * Public relations skills
```

```
                    * Fliers, TV/radio copy, posters, mail
                    * Orientation plan and space for meetings

                    * Outreach activities targeting low-income persons
                    * Day-long orientation activities that give job
                      information and guidance

                    * 10,000 aid recipients get info on ESP program
                    * 560 attend orientation meeting
                    * 560 understand the job market


        (3b) Low-income individuals complete self-assessments and are able
        to implement their self-sufficiency plans.

                    * Assessment materials
                    * Staff skilled in assessment
                    * Referral and service agreements with collateral
                      agencies

                    * Job placement assessment process
                    * Decision making process/ curriculum
                    * Referrals for jobs and education

                    * 84 referred to jobs
                    * 168 referred to education program
                    * 168 enrolled in ESP business training
                    * All above receive child care/transportation

        (3c) ESP participants are able to write high-quality business
        plans and have confidence to implement them.

                    * Business training curriculum designed to reach/
                      motivate low-income persons
                    * Staff skilled in models of adult education
                    * Classrooms

                    * Training components that motivate adult learners,
                      encourage self-confidence, and teach planning and
                      marketing skills

                    * Enrollees improve time management skills
                    * Enrollees increase their self-confidence
                    * 100 finish business plan
```

```
(3d) ESP participants prepare quality loan applications and have
access to needed capital.

          * Agreements with commercial banks on loan pools
          * Relationships with loan officers
          * Staff with TA skills in coaching

          * TA activities that bring loan applicants and loan
            officers together in positive interaction
          * TA activities that assist with start-up

          * 80 complete loan application
          * 60 get business loans
          * 75 start their own business

(3e) ESP participants are successful in starting businesses that
provide self-employment.

          * Staff with time for follow-up
          * Agreements with participants who promise to provide
            follow-up information

          * TA activities that provide assistance with ongoing
            management problems encountered during follow-up
            visits

          * 70 businesses survive first year
          * 60 businesses survive second year
          * 80% of clients reach self-sufficiency
```

Outcome: Participants who are AFDC recipients achieve self-sufficiency in greater numbers than a comparison group of matched recipients who go through job training and then get jobs.

Figure 5. Hierarchical Model of ESP Plan Showing Parallel Processes

Problem: 19% of the state's population is officially poor and face many barriers when trying to achieve economic self-sufficiency: low-paying jobs, lack of support services that would enable them to complete school so they can qualify for high-paying jobs, and the loss of Medicaid benefits if they go even slightly over the poverty line.

Goal: Low-income individuals and families who wish to move toward self-sufficiency encounter no barriers and can take one of three tracks: (1) on-the-job training, (2) education and training for technical jobs, and (3) business training which leads to self-employment.

```
Legend for Chart:
```

```
A - Objectives
B - Inputs
C - Methods
D - Results


A
          B
          C
          D
```

State Level

> Barriers preventing AFDC recipients from moving toward
> self-sufficiency are eliminated, and needed supports
> are increased.

> * Legislators who are committed to low-income families
> * Data showing that education/ training programs are
>   effective

> * Waivers that allow AFDC recipients to accumulate
>   assets
> * Waivers that allow AFDC recipients to keep Medicaid
>   benefits for 2 years

> * State has model of welfare-to-work
> * Legislature provides increased funding for child
>   care,transportation, and training

Community Level

> Community agencies are aware of their role in
> welfare-to-work and are willing to work with ESP to
> provide collateral support.

> * Community leaders with time and energy to work for
>   change
> * Increased funding for collateral services

> * Inter-Agency Council that works to improve the
>   coordination of work and training programs
> * Lobbying of the legislature

```
                 * Community agencies have sense of shared mission
                 * Community agencies provide resources to ESP

Organizational Level

         ESP participants have information to make wise career
         choices. They accept referrals to jobs or education,
         or they have skills necessary to start own business.

         * Collaborative agreements with wide range of
           organizations
         * Skilled staff, effective curricula adequate space

         * Outreach
         * Orientation
         * Assessment and referral
         * Training
         * Technical assistance
         * Follow-up

         * 50 successful placements in job training
         * 100 successful placements in ed. programs
         * 70s mall businesses established
```

Outcome: Participants who are AFDC recipients achieve self-sufficiency in greater numbers than a comparison group of matched recipients who do not participate in the ESP.

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