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USING CONCEPT MAPPING FOR PLANNING THE IMPLEMENTATION OF A SOCIAL TECHNOLOGY

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ABSTRACT

This research utilized concept mapping to analyze and compare the process of planning to implement a specific social technology—known as family based intensive in-home services (FABIIHS)—which has demonstrated effectiveness in certain settings and is being adopted in two new sites (the Upper Peninsula of Michigan and the Rio Grande Corridor in New Mexico). In each site, planning teams were formed to identify the factors which needed to be dealt with in order to implement a FABIIHS project in their setting. Planning team members consisted of direct service agency workers at the managerial and case practice levels from Indian agencies, state, and non-profit organizations which were part of the community service network and which therefore had to be involved to successfully implement the social technology of FABIIHS. Approximately 35 people participated in the three-step process which involved: (a) the generation of a set of eighty-one implementation factors; (b) sorting the factors and rating each one for their importance and ability to influence; and (c) interpretation and naming of the concept map. On the basis of this project, concept mapping is seen as a potentially valuable process which can be helpful in planning for the implementation of new social technologies.

To date there had been insufficient research on the process of planning to implement innovations in the human services. These innovations, more appropriately titled social technologies, are novel and technical means by which the human services accomplish their objectives (Thomas, 1978). They result from the fusion of research and development methodologies transferred from engineering and industry to the human services with experiential knowledge known to many as "practice wisdom" (Whittaker & Pecora, 1981). The development of social technologies is typically supported through research and demonstration grants provided to public agencies, non-profits, and institutions of higher education. Research on social technologies has primarily been evaluative in nature and as a result has emphasized outcomes (post-implementation results), while tending to ignore the planning process (pre-implementation and implementation issues and factors).

The exploratory research described in this article utilized concept mapping to analyze and compare the process of planning to implement a specific social technology which has demonstrated effectiveness in certain settings and is being adopted in two new sites. Specifically, concept mapping was used to study and compare the perceptions of human service staff employed in direct service agencies in two distinct sites who are planning to implement a social technology known as family based intensive in-home services (FABIIHS).

The stimulus for the development of social technologies like FABIIHS can be traced to the Adoption Assistance and Child Welfare Act of 1980, Public Law 96-272, which was passed to alter the way in which the public child welfare system was serving dependent children suffering from abuse and neglect. The law was designed to support and preserve the integrity of families, reduce the number of children "stranded" in the foster care system, set guidelines for permanency planning, and reverse federal financial incentives which had made foster care placement an immediate and seemingly advantageous choice when deciding how to respond to abuse and neglect cases. The law sought to keep families intact by preventing the unnecessary sep-

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aration of children from their parents, and emphasized the importance of providing services to support and strengthen families in an attempt to avoid removing the child(ren) and placing him or her in foster care.

In the attempt to preserve and strengthen families and reduce the number of children receiving substitute care, the federal Department of Health and Human Services' Office of Human Development Services in its R&D Coordinated Discretionary Funds Program for FY87 solicited proposals to administer demonstration projects addressing the theme of Foster Care Placement Prevention. A major innovative social technology in this area can be labeled family based intensive in-home services (FABIIHS). The social technology, as its name implies, consists of a family-focused intervention, of an intense and time-limited nature, delivered to clients in their own home. The objective is to quickly attempt to alter dysfunctional family behavioral and attitudinal patterns so children can remain with their biological parents.

The American Indian Law Center, Inc. (AILC), a national organization offering broad-based training and technical assistance to tribal and other governments in the areas of policy analysis, intergovernmental relations, planning and evaluation, and law-related services, was funded to administer a placement prevention effort entitled Project INTACT. Project INTACT sought to work with tribal human service agencies to promote and facilitate the development of placement prevention models consistent with FABIIHS characteristics, and assess the planning process to implement such programs. Concept mapping was seen as a potentially valuable tool for planning Project INTACT implementation.

METHOD

Sample

This project involved activity in two distinct implementation sites–The Upper Peninsula of Michigan and the Rio Grande Corridor in New Mexico. Planning teams were formed in each site to identify the factors which needed to be dealt with in order to implement a FABIIHS project in their setting. Planning team members consisted of direct service agency workers at the managerial and case practice levels from tribal governments, Indian agencies, state, and non-profit organizations which were part of the community service network and which therefore had to be involved to successfully implement the social technology of FABIIHS.

Developing the Concept Map

An initial series of planning meetings was conducted. Planning team members in each site were assembled and provided with a half-day presentation on family based intensive in-home services so there would be a common understanding of the structure of such programs, their characteristics, the nature of services, etc.

The first step in the concept mapping process was to have the members of both planning teams generate statements, or in this case what may be more appropriately labeled "implementation factors"—the items which would need to be dealt with to make a FABIIHS project operational. The brainstorming prompt used to generate these implementation factors is consistent with Williams' (1975) argument that implementation needs to focus concretely on what needs to happen to get something, in this case a social technology, put into practice. It was also assumed the relatively unstructured nature of the brainstorming activity would allow for both "technical" and "political" planning factors to be cited. The prompt was also structured so respondents would consider not just what they needed to do, but would also be motivated to think in a broader sense by considering what needs to happen in general. The specific prompt was:

In order to get a family based service project operating:

- What do you need to do?
- What do you think needs to be done?
- In other words, what needs to happen?

Twelve persons participated in the first New Mexico Planning Team session; twenty people were involved in the Michigan Planning Team session. The Michigan team generated ninety-one (91) implementation factors while the New Mexico team developed a list of fifty-three (53) factors.

In order to engage in a comparative analysis of implementation sites a master list of implementation factors needed to be devised. It would have been ideal to have both teams review each other's list and have them come up with a unified master list. Unfortunately, time and funding constraints precluded this option. Instead, two staff members of the American Indian Law Center's Project INTACT reviewed both lists to identify redundancies, and develop a master list which accurately reflected the range of items produced by the members of both planning teams. The master list contained eighty-one (81) implementation factors and is shown in Table 1. Each of the eighty-one (81) implementation factors was numbered and printed on a separate slip of paper.

In the second step of the process, all planning team members were asked to sort the master list of implementation factors into piles in a "way which makes sense to you." This was done to obtain a conceptual portrait of how the implementation factors were orga-

TABLE 1
LISTING OF EIGHTY-ONE STATEMENTS FOR CONCEPT MAPPING

1. Educate the community to understand the need for family based services
2. Define who the family is
3. Identify funding sources
4. Establish qualifications for providing services
5. Provide training on family based services
6. Assess current caseload for service needs
8. Have funding sources support tribal innovations
9. Funding agencies need to do less defending of turf
10. Define program from the tribal perspective, not solely from the funding source's perspective
11. Consider staffing needs
12. Reduce overlapping and/or conflicting roles of the workers
13. Identify families eligible for services
14. Educate and gain support of tribal council
15. Get tribal council to set family based services as a top priority
16. Structure services within tribal social services agencies
17. Advertise, recruit and hire workers
18. Consider who and what type of workers are needed
19. Teach the community about family based services
20. Get funding source to provide child welfare dollars to support family based services
21. Determine appropriate services for the family based services program
22. Secure funds (grantsmanship)
23. Establish job descriptions
24. Distinguish between chronic and "new" crisis families
25. Gain support of other service providers
26. Providers need to inform community of availability or their interest in providing family based services
27. Provide training in counseling
28. Obtain community support
29. Obtain data on number and types of current placements
30. Consider worker liability issues
31. Establish inter-agency agreements
32. Get funds for training
33. Set program goals and objectives
34. Provide concrete services, e.g., transportation
36. Coordinate for effective referrals
37. Be willing to terminate unsuccessful cases
38. Distinguish between prevention of abuse and neglect, and prevention of placement
39. Train supervisors jointly with workers
40. Develop short position paper on Indian family based services for tribes and Indian organizations
41. Recruit committed and compassionate staff
42. Define service catchment area
43. Examine impact of changing services on existing agencies
44. Network with courts
45. Establish data base of families served
46. Provide limited caseload for workers
47. Have program manager who is a skilled social worker
48. Provide on-going education and training
49. Set realistic family goals
50. Conduct public relations efforts
51. Catalog existing resources
52. Establish strong linkage to aftercare
53. Finalize Indian child welfare policy(ies)
54. Upgrade workers' salaries
55. Organize inter-tribal political efforts
56. Work with families in an environment where they will be receptive
57. Prevent high staff turnover
58. Develop service standards
59. Reduce jealousies and turf issues
60. Retain a flexible clinical approach
61. Collect information on other programs and adapt for own model
62. Prevent worker burnout
63. Encourage universities to teach family based services
64. Generate program operations guidelines
65. Provide worker incentive program
66. Establish inter-agency coordinating council to identify, motivate, foster collaborative relations
67. Coordinate with other providers to promote long term goal of family unity
68. Develop research and evaluation plans
69. Computerize communication systems
70. Focus on family unit
71. Learn about culture and incorporate into program
72. Establish appropriate supervision
73. Have leaders model appropriate behavior
74. Identify potential problems and barriers
75. Choose appropriate approach, e.g., team or individuals
76. Train non-Indian community to work effectively with Indian clients and agencies
77. Workers should model behavior for families
78. Address creaming effects, i.e., "easier" cases are accepted, or "hardest" cases are referred
79. Strengthen existing programs before developing new [ones]
80. Upgrade housing
81. Establish service priorities

nized and interrelated in the minds of planning team members.

In order to analyze and interpret the results of the sorting activity, the data from the sorts were entered into the Concept System software package developed by Trochim (this volume). Initially a multidimensional scaling (MDS) analysis was performed to scale the 81 factors in relation to one another based on item rating similarities. A two-dimensional MDS solution was employed to ease interpretation and comprehension. This allowed for the production of three distinct maps representing the geometric configuration of the 81 factors. The first was a composite map representing both planning teams. The second map represented only the Michigan team, and the third depicted the data for only the New Mexico team. The maps from each of the sites appeared similar and, consequently, the composite map was used. This map is shown in Figure 1. The statements on the map were grouped using Ward's algorithm for hierarchical cluster analysis. A 25 cluster solution was chosen as the starting point, and then fewer-cluster solutions (i.e., 20, 15, 6) were also generated. The various cluster solutions were subjectively and intuitively examined by Project INTACT staff who

Figure 1. MDS point map for Project INTACT.

used their knowledge and experience to determine the level at which both significant differentiation and meaningful categories of similar factors occurred. Combining the hierarchical cluster analysis with the distinction and commonality criteria, a six cluster solution appeared to be the most appropriate and useful.

From the perspective of Project INTACT staff, the implementation factors in Cluster 1 seemed to focus on engaging in activities which set the stage for FABIIHS to begin. Cluster 2 appeared to deal primarily with interagency matters while Cluster 3 tended to concentrate on what might be considered developmental and operational issues. Cluster 4 centered on funding concerns and Cluster 5 emphasized services. Finally, Cluster 6 targeted what we might call human resource matters. Project staff were anxious to find out how the planning team members themselves would define the clusters.

A second wave of planning meetings was conducted with the planning team representing each implementation site. There were several objectives for these sessions: (a) to have planning team members rate the implementation factors in terms of how important they perceived each implementation factor to be and to what degree they perceived they could influence each factor or make it happen; (b) to review the six cluster solution and see if planning team members saw it as insightful and appropriate for continued use; (c) assuming that the six cluster solution was acceptable, to have members of the teams come up with labels so they would ultimately be the ones to define the various clusters.

For both the importance and influence ratings each implementation factor was rated on a 7 point Likert-type response scale with 1 being almost no importance/influence, 4 being moderate importance/influence, and 7 being extreme importance/influence. Those members of the team who were not present for the second meeting had both instruments mailed to them and were asked to complete and return them to the Law Center; 9 out of 10 people returned completed instruments. A total of 37 people completed both instruments – 18 from New Mexico and 19 from Michigan.

When planning team members completed the instruments, they were asked to consider the six cluster solution. Both planning teams agreed it was a useful means of interpreting and making sense of the implementation factors. Once the six cluster solution was accepted, planning team members in attendance were asked to come up with a name for each cluster. Unlike the instruments gauging perceptions of importance and influence, which were mailed to those members of the planning team not attending the second meeting, only those persons attending the second meeting at each implementation site were asked to generate names for the six clusters. Moreover, not all people attending the meetings turned in a sheet. As a result, only 23 people responded to either some or all of this portion of the study.

Given sufficient time it would have been ideal to have the planning team members work through the various names they had given to each of the six clusters or implementation domains and reach consensus on a name for all six. Unfortunately there wasn't sufficient time to allow for that to occur so Project INTACT staff made use of a wordcount procedure to try and come up with a name for each domain.

For cluster 1 the words used the most were: community (17 times); education (15 times); tribe/tribal coun-

cil (5 times); and support (4 times). There was an almost even split in the use of these words between the members of the planning team in each implementation site. Three more people in Michigan than in New Mexico use the word community, but there were 3 more respondents from Michigan. Therefore, it seems reasonable to define this implementation domain as COMMUNITY EDUCATION FOR SUPPORT.

For cluster 2 the words used most were: coordination (10 times); networking (7 times); collaboration (4 times); interagency and service providers (both 3 times). Virtually every respondent included at least coordination, collaboration, networking, or cooperation in their label. It is apparent the second implementation domain can be labeled COORDINATION AMONG AGENCIES.

For cluster 3 the word family was used (13 times), services (9 times), identification (8 times), and need (4 times). Again there was an almost even split in use of the words by the members of each team. The third implementation domain can be labeled FAMILY IDENTIFICATION FOR SERVICES.

For cluster 4 funding or fundraising was mentioned (18 times), with another word dealing with financial matters, fiscal, cited (2 times). Clearly, the fourth domain can be christened FUNDING.

For cluster 5, program was mentioned (7 times), services was also used (7 times), implementation (4 times), development (3 times), and planning (2 times). It would seem the fifth domain is about PROGRAM AND SERVICE DEVELOPMENT.

Finally in cluster 6 the words used the most were: staff (13 times); training (10 times). The sixth implementation domain can be coined STAFF TRAINING.

Project INTACT staff reexamined the six cluster solution in light of the labeling exercise to decide if the original six cluster solution still seemed appropriate to use for analysis. The criterion used was to consider if the six cluster solution accomplished adequate differentiation and similarity in the grouping of implementation factors consistent with the results of the labeling effort.

After additional review of the six cluster solution by Project INTACT staff, several of the implementation factors seemed to be grouped in a category which did not make sufficient sense, or seemed totally inappropriate. This is not surprising since the hierarchical cluster analysis only groups according to spatial relationship, and fails to take into account any other criteria. After additional review of the spatial position of several of the implementation factors in the six cluster solution several minor modifications were made to the computed map. These are illustrated in the map shown in Figure 2. The figure shows both the original (broken line) and modified (solid line) six cluster solutions. Overall, six (6) implementation factors were moved to a cluster which made more sense for them to be in.

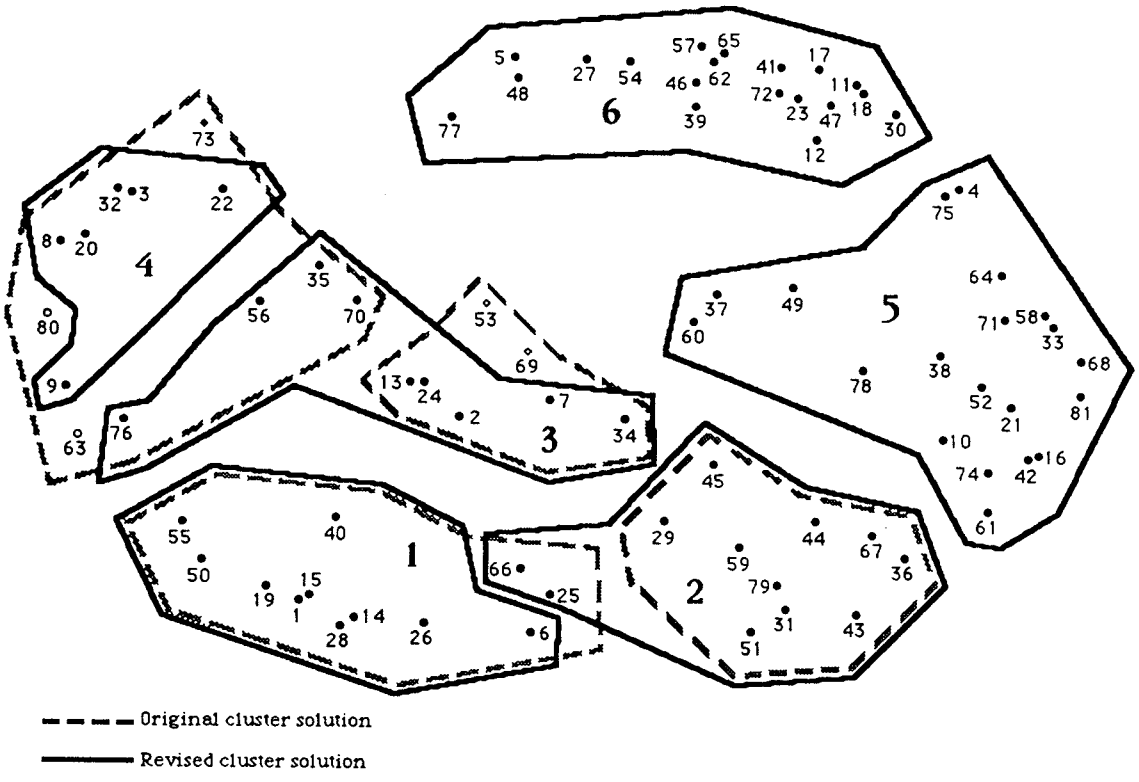

Figure 2. Original and modified six-cluster concept map for Project INTACT.

After some thought and discussion about their connection to the cluster they were placed in, five (5) implementation factors were completely eliminated from additional analysis. Clusters 5 and 6 were not modified at all.

More specifically, if one looks at Figure 2 it is clear that implementation factor #25—and implementation factor #66 are on the border between Clusters 1 and 2 and probably could have been placed in either cluster, although the six cluster solution chose to place both of them in Cluster 1. Project INTACT staff decided they both fit better in Cluster 2. Note that it was decided to keep implementation factor #6 which is spatially very close to numbers 25 and 66 in Cluster 1 and not move it.

The same principle was at work in transferring four other implementation factors—numbers 35, 56, 70, and 76. Again, referring to the concept map in Figure 2 reveals implementation factors 35, 70, and 56 could have just as easily been assigned to Cluster 3 or 4, but were assigned to Cluster 4. Yet, they make more sense in Cluster 3, so they were moved. Implementation factor 76 seemed inappropriate in Cluster 4 and appeared more relevant to Cluster 3 so it was shifted.

Five factors were eliminated from the master list for subsequent analysis. Three of these—63, 73, and 80—had been grouped in Cluster 4 in the original six cluster solution. Yet, none seemed directly related to the dominant theme of that cluster. Thus, there was concern that they were outliers, that their inclusion would bias the analysis of that particular cluster. Instead of somewhat arbitrarily placing them in another cluster they were simply eliminated. Two others eliminated were numbers 53 and 69. They had been placed in Cluster 3, yet upon review by Project INTACT staff they appeared tangential to the focus of the cluster.

This highlights an important issue when using concept mapping. The statistical processes, and in particular the cluster analysis, must be weighed against judgment and experience. Our shifting of certain implementation factors demonstrates the importance of incorporating experience and common sense when utilizing concept mapping.

Analysis of the Importance and Influence Rating Data

Once the cluster names and their factors had been agreed upon, the map was used to display the results of

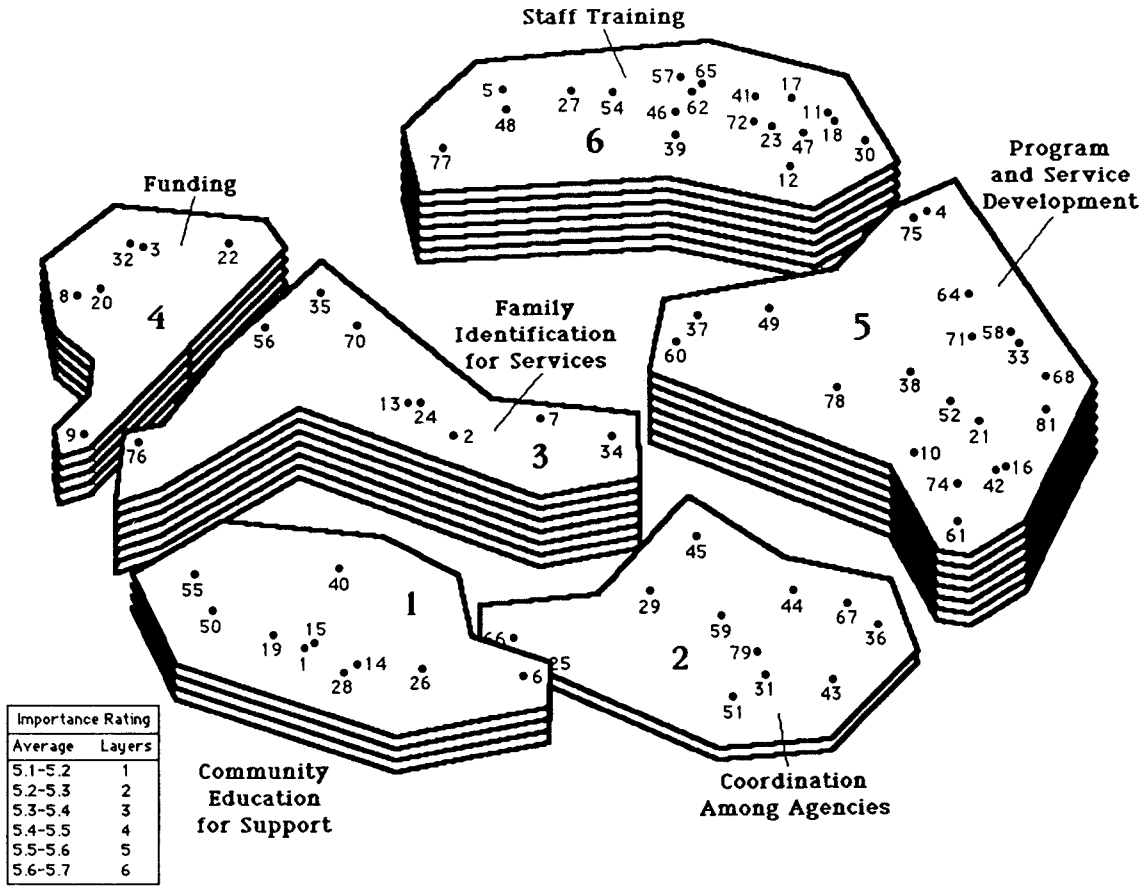

Figure 3. Importance rating concept map for Project INTACT.

the ratings. Here, the results are shown by cluster for the importance ratings in Figure 3 and for the influence data in Figure 4. A comparison of the two is particularly useful. First, examination of the legends on each figure indicates that in general importance ratings were higher than influence ratings. This is not surprising—in many contexts people feel relatively powerless to influence factors which they consider important. Second, both maps show a fair amount of agreement—in both cases, participants attached relatively high importance and ability to influence to the clusters Staff Training, Program and Service Development, Family Identification for Services, and Community Education for Support. Finally, it is perhaps most revealing to note the two major clusters for which the ratings diverged—Funding was seen as important but not easily influenced, whereas Coordination Among Agencies was seen as relatively unimportant but relatively easy to influence. Clearly, it is worth exploring with the participants what the implications of these ratings are for the implementation of a FABIIHS project.

CONCLUSIONS

The use of concept mapping to engage in a comparative analysis of planning to implement the social technology of FABIIHS has proven to be extremely insightful. It helped to generate the implementation factors which need to be dealt with in order to operationalize a FABIIHS project, as seen from the critical perspective of the staff who work in direct service agencies in two distinct implementation sites. Moreover, the process has resulted in the specification and labeling of major domains of implementation factors which must be considered when implementing a FABIIHS project in those sites. The rating of the implementation factors in terms of perceived importance and ability to influence documented which factors and domains are most important and most susceptible to influence by direct service agency staff. The analysis of the data contributes to staff at both sites' understanding of what needs to be done and dealt with in order to get the social technology going.

The data generated also lends itself to additional vital

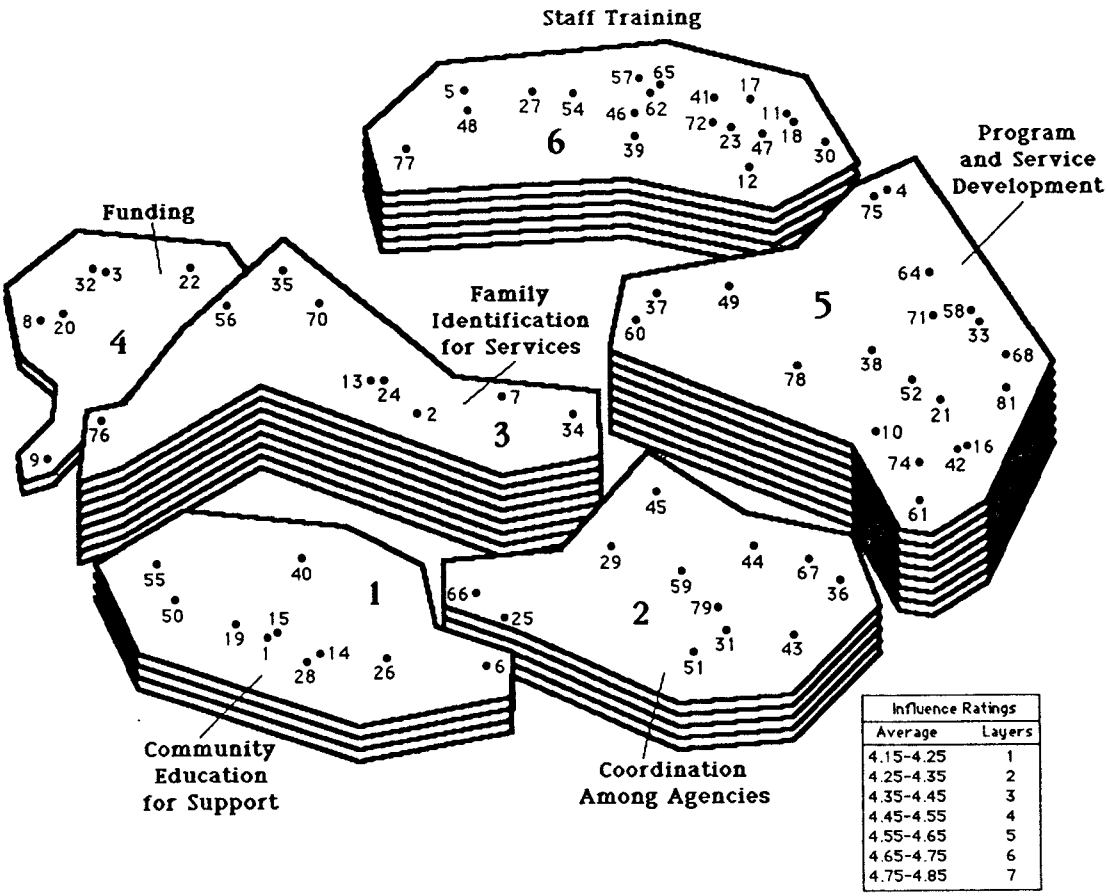

Figure 4. Influence rating concept map for Project INTACT.

analysis to facilitate pre-implementation planning. For one thing, looking at the interaction between importance and influence for each factor and for each domain might engender some useful insights and suggest some important implications for the planning process. Then too, the highest and lowest rated implementation factors in terms of perceived importance and ability to influence, within each domain, could be compared across sites to determine the site-specific or potential generalizability of the findings.

In terms of making broad practical use of the results, these preliminary findings can be used by policymakers and/or managers and direct service staff if they are considering initiating a FABIIHS project in one or more additional sites. From a theoretical standpoint the findings of this study can contribute to moving beyond the global acknowledgment of a "political" and "technical" dimension to planning, to actually describing specific political and technical implementation factors. Also, the findings can begin to define the contours of numerous major domains of implementation factors. By repeating this process with the same, and other social technologies, our understanding of the broad planning for implementation process could be increased. Hypotheses suitable to subsequent study could be created. Finally, in addition to the comparison of perceptions by site, the perceptions of managers could be compared with those of direct service workers, and the perceptions of men could be compared with those of women to see how they differ and to promote theory building.

Very little attention to or study of pre-implementation planning has taken place. This is unfortunate, especially since millions upon millions of dollars are spent by governments on a yearly basis to support the implementation and replication of innovative social technologies to ameliorate social problems. By engaging in a little "front-end" work considerable time and money can possibly be saved so effective social technologies can be implemented in a quicker and smoother manner. Concept mapping is a sophisticated, yet easy to use tool, which helps portray and assess key aspects of the planning process. The use of concept mapping can make a significant contribution to the theory and practice of pre-implementation planning.

REFERENCES

THOMAS, E.J. (1978). Generating innovations in social work: The paradigm of developmental research. *Journal of Social Service Research, 2*, 95-115.

WHITTAKER, J.K., & PECORA, P.J. (1981). The social "R&D" paradigm in child and youth services: Building knowledge convivially. *Children and Youth Services Review, 3*, 305-317.

WILLIAMS, W. (1975). *Implementation analysis and assessment*. Public Policy paper, Institute of Governmental Research, University of Washington.

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