Concept Mapping: An Approach for Evaluating a Public Alternative School Program

Calvin L. Streeter, Cynthia Franklin, Johnny S. Kim, and Stephen Tripodi
Concept Mapping: An Approach for Evaluating a Public Alternative School Program

Calvin L. Streeter  
University of Texas at Austin

Cynthia Franklin  
University of Texas at Austin

Johnny S. Kim  
University of Kansas

Stephen J. Tripodi  
Florida State University

Submitted February 16, 2009

Contact information: Calvin L. Streeter, PhD, Meadows Foundation Centennial Professor in the Quality of Life in the Rural Environment, School of Social Work, University of Texas at Austin; 1 University Station D3500, Austin, Texas 78712; 512-471-0543 (voice); 512-471-9600 (fax); cstreeter@mail.utexas.edu

Cynthia Franklin, PhD, LCSW, Stiernberg/Spencer Family Professor in Mental Health; School of Social Work, University of Texas at Austin; 1 University Station D3500, Austin, Texas 78712; 512-471-0533 (voice); 512-471-9600 (fax); cfranklin@mail.utexas.edu

Johnny S. Kim, PhD, LICSW, Assistant Professor; School of Social Welfare; University of Kansas; 1545 Lilac Lane, Lawrence, KS 66044; 785-864-2647 (voice); jkim@ku.edu

Stephen J. Tripodi, PhD, Assistant Professor; College of Social Work; Florida State University; 296 Champions Way, Tallahassee FL, 32306; 850-645-1572 (voice); stripodi@fsu.edu
Evaluating a Public Alternative School Program

Abstract

Objective: This article describes how concept mapping techniques were applied to evaluate the program development of a solution-focused, public alternative school program. Method: Concept systems software was used to create 15 cluster maps based on the statements generated from students, teachers, and school staff. Additionally, pattern matches were analyzed to examine the degree of consensus between the different groups and represent the level of agreement on the content of the cluster maps. Results: Findings appear to support the fidelity of the solution-focused approach in the practice of the alternative school as evaluated by the perceptions of the teachers, administrators and staff. Additionally, what students thought were important in helping them achieve academic success were clusters that centered around relationships and future goals. Teachers, administrators, and staff also viewed relationships as important, but they rated more concrete aspects of the school and goal-setting as being more important. Conclusions: Concept mapping appears to be a useful program evaluation methodology for school social workers to consider and a valuable tool for examining complex problems and solutions within school organizations.

Keywords: School Social Work, concept mapping, Solution-focused, evaluation research, alternative school program
Addressing complex social problems in schools requires a range of program development strategies that can help school social workers build effective programs. Information gathering tools that help school social workers improve and evaluate school programs are especially relevant to today’s evidence-informed practice situations. Thus, school social workers must be able to assess and improve programs on multiple levels (e.g. administrative, staff, and client services levels). Concept mapping is a program planning and evaluation tool that provides a unique way to articulate, conceptualize, and visually represent thoughts and ideas regarding program characteristics and outcomes (Trochim, 1989). While it was specifically developed as a method for program planning and evaluation, it has evolved and is currently being used for many different purposes related to developing effective programs and practices. This technique combines a focus group approach with the use of concept mapping software that quantitatively analyzes qualitative data. This approach differs from other techniques in that it integrates input from a multiple sources to create a series of maps that reflect the composite thinking of a group and uses multivariate analyses to construct the maps (Kane & Trochim, 2007). Concept mapping is currently being used in the following domains: assessing cultural competence and perceptions of clients, developing measurement systems, examining program fidelity, assessing the health and mental health needs of disadvantaged groups, and examining community responses to trauma (Biegel, Johnsen, & Shafran, 1997; Campbell & Salem, 1999; Davis, 2004; Johnsen, Biegel, & Shafran, 2000; Robinson & Trochim, 2007; Shern, Trochim, & LaComb, 1995).

Concept mapping provides a practical approach to program evaluation that can make use of information from multiple stakeholders in assessment and evaluation of community programs. This makes it ideal for use in educational programs that combine information gathering with problem-solving activities to produce practical solutions. This article briefly describes the history
of concept mapping and provides an overview of the methodology. Concept mapping is then demonstrated using an example of how it was applied to evaluate the program development of a public alternative school program.

*Overview of Concept Mapping*

Concept mapping was developed by Dr. William Trochim at Cornell University in the late 1980’s. This method combines qualitative and quantitative research techniques to produce a map representing ideas usually produced in a focus-group brainstorming session. Dr. Trochim introduced concept mapping in a 1989 article titled, *An introduction to concept mapping for planning and evaluation* published in the journal, *Evaluation and Program Planning*. Trochim provided a detailed account of the following six steps of concept mapping: 1) Preparation, 2) Generation of Statements, 3) Structuring of Statements, 4) Representation of Statements, 5) Interpretation of Maps, and 6) Utilization of Maps.

Before Trochim developed concept mapping software, program evaluators used a version of this approach to “free-hand” the articulation of ideas by individuals for developing a conceptual framework of ideas (Novak & Gowin, 1984; Rico, 1983). According to Trochim (1989), the major differences between his version of concept mapping and others is that his method is more appropriate for group planning because it generates a group-aggregated map representing diverse ideas and perspectives. This makes concept mapping especially useful in capturing the ideas of both staff and consumers in community programs. In particular, his concept mapping software makes use of multivariate statistical techniques that are especially helpful for examining complex problems and relationships, and exploring possible solutions. The problem solving approach used in concept mapping makes it especially useful in social work practice.
Literature Review

Concept mapping has been used in several community-based programs to identify important program components and to assess different views of multiple stakeholders. Trochim, Cook, and Setze (1994), for example, used concept mapping to develop a conceptual framework to reflect the views of mental health staff regarding a supported employment program. Fourteen staff members participated in the concept mapping sessions, which focused on the specific activities of a supported employment program. Similarly, Yampolskaya, Nesman, Hernandez, and Koch (2004) used concept mapping to help the staff at a mental health agency identify 100 program services and produce a logic model that explained how a program was designed to produce client changes. To help operationally define geriatric interdisciplinary teams, Holmes, Fairchild, Hyer, and Fulmer (2002) utilized concept mapping techniques to define the purpose of geriatric interdisciplinary teams.

Concept mapping has also been used to better understand the needs of mental health consumers. For example, Shewchuk and O’Connor (2002) wanted to identify the health care issues that elderly perceive as particularly important. The concept mapping statistical techniques known as multidimensional scaling and hierarchical cluster analysis were used to categorize important aspects of health care delivery. Likewise, Wolf, Parkman, and Gawith (2000) used concept mapping to explore what community mental health programs should be doing to provide care for mentally ill people in the community. Various perspectives were gathered from a variety of stakeholders such as mentally ill clients, family members, and mental health professionals in an effort to identify key tasks for community mental health staff in supporting mentally ill. Kunkel and Newsom (1996) applied a similar mixed methodology at a university counseling clinic to understand the relationship between different problems that cause clients to seek
counseling. Campbell and Salem (1999) used concept mapping to help determine how community resources for sexual-assault victims could be improved, while Biegel, Johnsen, and Shafran (1997) used concept mapping to examine barriers to mental health services for African American families with a mentally ill family member. More recently, Davis, Saltzburg, and Locke (2009) examined how communities can recognize and support the emotional and psychological needs of sexual minority adolescents.

Concept mapping has also been shown to be a useful methodology for program evaluation. Shern, Trochim, and LaComb (1995) used concept mapping as an evaluation tool to help assess the fidelity of a model transfer for an experimental program serving homeless mentally ill adults. Concept mapping allowed the program evaluators to identify similarities and differences in the content and structure of the experimental program model with how the developers originally conceptualized the program. Nieuwenhuizen, Schene, Koeter, and Huxley (2000) utilized concept mapping techniques in an effort to evaluate the conceptualization of a quality of life measure for mentally ill adults. Concept mapping allowed the researchers to examine the type and total number of domains that should be included in the quality of life measurement instrument based on information from clients, family members, and professional care-givers. Similarly, Corcoran (2005) employed concept mapping to evaluate the reliability and validity for three versions of a mental health referral checklist for youths in the juvenile justice system.

Concept mapping appears to have been used with success in a variety of community programs and fields of practice, and appears to be most appropriate for new areas in which the program planners would like to explore the perceptions of different populations within a particular group. To date, there have not been any studies published in which Trochim’s Concept
Systems software was used in a school setting. Concept mapping appears beneficial in a school setting because it can be used to empirically evaluate different program components, which our case example illustrates.

Concept mapping helps researchers create hypotheses by generating ideas and concepts from participants. Concept mapping is an efficient means of collecting information from diverse participants because ideas are usually generated in a group format. This too makes concept mapping especially useful for school settings because multiple stakeholders must be taken into account when planning and developing programs. Concept Systems software presents themes that illustrate consensus in participants’ ideas and displays the information in the form of a visual map where collective information can be more easily understood (Trochim, n. d).

Concept Mapping Methodology

The six steps of concept mapping, as introduced by Dr. William Trochim (1989), are the following: 1) Preparation, 2) Generation of Statements, 3) Structuring of Statements, 4) Representation of Statements, 5) Interpretation of Maps, and 6) Utilization of Maps. Concept mapping participants usually contribute in a group conversation similar to a focus group. Participants are first asked to brainstorm, as a group, to generate ideas related to a specific question or statement identified by the researcher. These statements are printed on cards, and then participants sort them into piles in a way that made conceptual sense to them and then label each group of statements with a word or phrase that best described the common “idea” represented by the statements in that group. Participants are then asked to rate each statement on a scale defined by the program evaluators. Rating scales are often used to determine whether participants view some statements as more important than others. After group participants generate, sort, and rate statements produced in a brainstorming session, concept maps are created.
in the Concept Systems Inc. software, which uses multivariate statistical techniques, including multidimensional scaling and hierarchical cluster analysis, to provide visual representations of relationships and relevance of the identified concepts (Trochim, 1989).

The concept mapping system makes use of multidimensional scaling to plot each statement made by participants on a point map. Points on the map represent individual statements. Concept mapping determines the position of points based on participants’ sorting of the statements into conceptually related piles. Statements sorted together by participants that show greater consensus are plotted together and have closer proximity on the scale than statements not sorted together (Brown & Calder, 2000).

The concept mapping system assigns a numerical value, known as a bridging value, to each statement that ranges from 0.0 to 1.0. Bridging values reflect the likelihood that participants sorted statements similarly. A bridging value of 0 indicates that participants sorted that statement similarly with other statements. A bridging value of 1 indicates that participants sorted the statement differently. The bridging values of each statement within a cluster are then averaged to produce a bridging value for the cluster (Brown & Calder, 2000). Conceptually, clusters with high bridging values are seen as clusters whose statements are linked with other clusters on the map. They help to determine how clusters are interrelated.

Using hierarchical cluster analysis, statements on the point map are organized into non-overlapping clusters based on their proximity to the other statements. The program planners or evaluators involved in the concept mapping exercise decide the number of clusters that make the most conceptual sense and are most appropriate for answering the specific focus questions. Similar to coding qualitative research, statements included in one cluster theme that seem to represent two different themes may need to be split into a different conceptual cluster. This
process often increases the number of clusters, allowing the statements to be differentiated so that they fall into two different clusters instead of one. Data from the participants’ ratings of statements is illustrated by displaying layers within the clusters. A cluster with more layers includes statements that were rated as more important than those within clusters with few layers (Johnsen et al., 2000). The following example of concept mapping illustrates the use of the approach as it was applied in public school program for at-risk high school students.

Concept Mapping: A School-based Application

Concept mapping was used as part of a program evaluation in a public, alternative high school that enrolled approximately 350 students. As a public school of choice, any student with ten or more credits in the school district who wish to earn a high school diploma could choose to enroll in this alternative high school. This program used a self-paced, integrative curriculum and was designed for 11th and 12th graders in a medium size school district in the southwestern United States. It was a new program that was less than five years old at the time the concept mapping project was completed and was purposely designed to engage urban high school dropouts or students at risk for dropping out and to help them complete their high school education. The ethnic make-up of the school consisted of 44.1 percent Caucasian, 36.6 percent Hispanic, 18.2 percent African American, .08 percent Asian American, and .03 percent Native American.

The purpose of the concept mapping exercise was to help examine the program’s fidelity toward its' guiding theory and philosophy, and to evaluate the most important program features that contribute to the program’s mission to graduate at-risk students. To aid in the engagement and work with students who have at-risk characteristics, the alternative school program adopted a strengths-based theoretical approach based on solution-focused brief therapy. All administrators,
teachers, and staff were trained in solution-focused techniques and coached to use these methods in classrooms and counseling sessions. The goal of the alternative school was to create a strengths-oriented school organization whose culture and philosophy are consistent with the change process of solution-focused brief therapy. Moreover, the alternative school aims to empower a community of learners so that individual students could graduate from high school despite significant personal, familial, and community risk factors that predisposed them toward dropout.

The program planners used eight program characteristics that defined the solution-focused philosophy within the high school. These characteristics are consistent with the core components of the solution-focused approach that have been identified in research and intervention manuals (Kim, 2008; Kim & Franklin, 2009).

1. Faculty emphasis on building strengths of students;
2. Attention given to individual relationships and progress of the students;
3. Emphasis upon the students’ choices and personal responsibility;
4. Overall commitment to achievement and hard work;
5. Trust in students’ evaluations;
6. Focus on students’ future success instead of past difficulties;
7. Celebrating small steps towards success, and
8. Reliance on goal-setting activities (Franklin, Garner, & Berg, 2007; Kelly, Kim, & Franklin, 2008).

These program characteristics served as guiding principles for the development and evaluation of the alternative school program.

*Exploring Reasons for Program Success*

For this particular concept mapping example, five different steps were completed over two to three meetings. The five basic steps included:

1. **Brainstorming statements** (done as a group)
2. **Sorting the data** (done by individuals)

3. **Rating the data** (done by individuals)

4. **Computing the maps** (completed by the researcher)

5. **Interpreting the data** (completed by the researcher).

The researchers asked the school administrators, teachers, staff, and students to complete three specific tasks: brainstorm statements in response to a focus statement, sort statements generated during the brainstorming exercises, and then rate the statements using a 5 point scale. Student participants attended separate concept mapping sessions for teachers, staff, and administrators so that they could be more open during the brainstorming session. The students participating in the concept mapping session were selected from the principal’s advisory council.

The brainstorming sessions for both students and teachers, administrators, and staff were held at the school. Thirty-seven adults and 14 students participated in the concept mapping sessions. Participants from both sessions generated a combined total of 182 (107 from staff/admin/teachers and 75 from students) unique statements in response to the following focus statement: *Describe the specific characteristics of the alternative school that help students achieve their educational goals.*

Statements from the brainstorming sessions were then entered into a computer and 182 cards were printed, each containing a unique statement. Participants were asked to individually sort all 182 statements into piles that they felt had a similar meaning and to give each pile a name. The only guidelines for placing statements into piles were that each statement could only be placed in one pile, statements could not be put in a single pile, and all statements could not be put in their own pile. Participants were asked to group the statements in a way that made sense to them and to create piles that represented a common concept.
After all the 182 statements were sorted, participants filled out three rating sheets which contained all 182 statements and three different rating questions. The three rating sheets asked:

1. *When comparing the alternative school to a traditional public high school, how unique is each of the characteristics listed below?* Participants were asked to rate each of the 182 statements on a 1 to 5 Likert scale where: 1=not at all unique to 5=extremely unique.

2. *Considering the unique features of the alternative school, how important is this characteristic in helping students graduate from high school?* Participants were asked to rate each of the 182 statements on a 1 to 5 Likert scale where 1=not at all important to 5=extremely important.

3. The final rating sheet gave a brief overview on the characteristics of solution-focused therapy and asked, *Given the characteristics listed above, how closely does each statement below match with the solution-focused, strengths perspective?* Participants were asked to rate each of the 182 statements on a 1 to 5 Likert scale where 1=no match and 5=a perfect match.

The rating session involved the same teachers, administrators, and staff employees that participated in the first session. However, a different student sample was purposely selected by school social workers and counselors to participate in the rating session in order to get a broader student perspective. Therefore, none of the students from the principal’s advisory council participated in the second session and a new student sample was selected in an effort to gain more student participation.

Working individually, each participant completed each rating sheet using the scale presented. Participants were asked to try and rate the statements so that there was about an equal number of statements with each rating code (Kane & Trochim, 2007). That is, participants should try to have about an equal number of statements with ratings of 1, 2, 3, 4, and 5. Because students were not familiar with nor trained in the solution-focused therapy model, the rating sheet on solution-focused therapy by students was not used in the pattern matching analysis. However, the process of the concept mapping alerted the faculty and staff of the need to include students in the solution-focused in-service trainings.
Results

Concept mapping made it possible to sort questions and combine them into clusters and to further merge the clusters together to make the most sense of the information that was provided by participants. Making use of the concept mapping software, a cluster replay analysis was used to determine the total number of clusters that were to be included in the final analysis. Jackson and Trochim (2002) explain, “This analysis begins with each statement as its own cluster and tracks the merging of the statements into clusters up to a 20-cluster solution” (p. 316). Using the “Worksheet for Deciding on the Number of Clusters” and a printout of the cluster replay list, it was also possible to identify which clusters were merged at each step starting from the top of the list. See figure 1 example below.

Insert figure 1 here

Reading through the list of statements for each cluster from the cluster replay list, the program evaluators determined whether they agreed, disagreed, or were undecided about whether those clusters should be merged. In selecting the final cluster solution, the evaluators selected the lowest number of clusters on which there was consistent agreed. The final decision was to use 15 clusters because it produced a richer description and understanding of the different components of the alternative school (see appendix 1 for list of statement by cluster). The cluster map was taken to a focus group to validate the meaning of the clusters and determine cluster names. The focus group—which consisted of 3 students, 2 teachers, the principal, a social worker, and a counselor—came up with the following cluster names and description of the cluster concept:

1. **Relationships**: reflecting the broad relationships between principal and student as well as professional relationships among staff.

2. **Professional Environment**: recognizing and appreciating each other’s strengths and skills and the ability to work with each other to preserve the school’s mission.
3. *Respect Evident Throughout the School:* trust and respect evident throughout the school amongst students, teachers, staff and administrators.

4. *Strength-Based:* school’s focus on strengths in students, teachers, administrators, and staff.

5. *Sense of Community:* close, supportive, and nurturing relationships within the school.

6. *Student-Student Interaction:* student’s respect for each other and appreciation of differences.

7. *Empowering Culture:* individual freedoms and encouragement of personal responsibilities given to students.

8. *Cutting Edge:* techniques used at the school that are non-traditional and unique to the alternative school.

9. *Organizational Foundation:* how the school is set up, e.g. class schedule, academic plans, orientation, and school staffing.

10. *School Size and Structure of the School Day:* similar to cluster 9 expect this cluster gives specific examples of school day’s schedule and classroom characteristics.

11. *Admission and Exit:* unique features of graduation requirements and admissions criteria.

12. *Resources Directed to Student Success:* individualized services that the school provides to help students meet academic requirements, continue on to post-secondary education, and obtain employment skills and experiences.

13. *Preparation for Life:* similar to cluster 12, but focus on specific programs for increasing post-secondary education and employment for the student.

14. *Student Success:* helping students define and achieve personal goals and recognizing their success in meeting those goals.

15. *Continuous Improvement:* continually examining their practices and willingness to make changes to better help students achieve their educational goals.

*Interpreting Cluster Maps*

Four of the clusters in the top right corner of the map can be grouped together because they involve the theme of community. These clusters: *Respect Evident Throughout the School, Sense of Community, Student-Student Interaction,* and *Empowering Culture* all emphasize relationships throughout the school. Statements in these clusters focus on collegiality and the
strong sense of community felt by students, teachers, and staff. The average bridging values for these four clusters ranged from 0.07 to 0.19, which indicates these clusters are tighter and people sorted statements together into similar piles.

Insert Figure 2 here

The four clusters on the bottom right corner can also be grouped together because they involve the theme of school organization. These clusters: *Organizational Foundation, School Size and Structure of the School, Cutting Edge, and Admission & Exit* emphasize the unique aspects of the school. Statements in these clusters represented the structure of the school, unique programs and non-traditional teaching practices that help students succeed in their academic goals. The average bridging values for these four clusters ranged from 0.21 to 0.43, which also indicates people sorted statements together in similar piles. To help further analyze all the cluster maps development from the sorting and rating, pattern matches were conducted through the concept mapping software.

*Pattern Matching*

After the final cluster map was selected and analyzed, the concept mapping software made it possible to complete pattern matches. Pattern matches are defined as the degree of consensus between different groups and were conducted based on the three rating sheets and demographics. Pattern matching represents the level of agreement on the content of the cluster map by subgroups, i.e. administrators verses teachers verses students. It can also be used to compare ratings on different scales within one group. Labels on each axis are the same labels as the clusters created in the final cluster map. These cluster labels are ranked in order of importance from top to bottom for each group. These two measures aggregated at the cluster level are compared to see if there is consensus or disconnect between groups. If the line
connecting the two axes is horizontal, there is perfect consensus or match. Pattern matching also calculates a correlation coefficient that describes the strength of the relationship or match between the two variables. A value of 0 indicates no match where a value of +/-1 indicates a perfect match (Trochim, 2000).

The first pattern matching (see Figure 3) compared how teachers, administrators, and staff scored the uniqueness rating sheet relative to the importance rating sheet. That is, on the left axis, teachers, administrators, and staff rated how unique the characteristics are at the alternative school while on the right axis they rated how important these unique characteristics are in helping students achieve their educational goals.

The higher scoring clusters for the uniqueness of the alternative school tended to be concrete features of the school like cutting edge practices, school size & structure of the school day, and admission and exit policies. Teachers, staff, and administrators rated statements in these clusters very high in being unique features of the alternative school when compared to other traditional high schools. When rating how important these unique features are at helping students achieve their educational goals, clusters that deal more with school culture and relationships were scored higher on the right axis.

Clusters such as Respect Evident Throughout the School, Sense of Community, Student Success, and Strengths-Based were considered the most important features at alternative school in helping students achieve their educational goals. This helps explain the weak correlation (r=.28) obtained between these two measures. The most unique features of alternative school tended to be concrete organizational aspects of the school while the most important features in helping students achieve their academic goals were relationships and school culture.
The second pattern matching (see Figure 4) compared how staff, administrators, and teachers rated importance and the solution-focused perspective. The left axis looked at how important the unique features of the alternative school are in helping students achieve their educational goals while the right axis looked at how closely these characteristics match the solution-focused, strengths perspective. This pattern match had a high correlation ($r=.72$) indicating that there is high degree of agreement between the two ratings.

Insert Figure 4 here

Three clusters (Respect Evident Throughout the School, Sense of Community, and Strengths-Based) were in the top five clusters for both axes. Teachers, administrators, and staff rated the unique features that help students meet their educational goals were also consistent with the characteristics of the solution-focused, strengths perspective that defined the school’s culture. Participants from the focus group who examined these pattern matching charts explained that they become invested in the solution-focused model because they see it as being important in helping students succeed academically. They also see the characteristics of the solution-focused approach as being consistent with the important features in helping students meet their educational goals.

The final pattern matching examined the consensus on important characteristics that help students meet their academic goals between teachers/administrators/staff and students. The correlation coefficient was weak for this pattern match ($r=.32$), which indicates there was some disconnect on what students thought were important and what teachers/administrators/staff thought were important. What students thought were important in helping them achieve academic success were clusters that centered around relationships like Student-Student Interaction, Sense of Community, and Empowering Culture, as well as clusters that center around
future goals like *Preparation For Life* and *Strengths-Based*. While teachers, administrators, and staff also viewed relationships as important, they rated more concrete aspects of the school and goal-setting as being important. Clusters like *Organizational Foundation*, *Professional Environment*, and *Student Success* were higher on the teacher axis than on the student axis.

Discussion

From the cluster map analysis, 15 clusters were generated that represent common ideas of how the statements are related. In examining the 15 clusters, two themes emerged from the final cluster map: sense of community and unique organizational practices with each theme containing four clusters. The pattern matching analysis further described how these themes are rated between teachers, administrators, staff, and students. The higher scoring clusters for the uniqueness of the alternative school tended to be concrete features of the school like cutting edge practices, school size & structure of the school day, and admission and exit policies. Asking about unique features of the program was especially important for assessing the importance of the program and how it differed from other high school programs that were less expensive, but were not designed to educate students who were at-risk for dropping out of school. When rating how important the alternative school’s unique program features are at helping students achieve their educational goals, clusters that deal more with school culture and relationships scored higher on the right axis.

Teachers, administrators, and staff also see the characteristics of the guiding philosophy of the solution-focused approach as being consistent with program components identified as being instrumental in helping students achieve their educational goals. This finding appears to support the fidelity of the solution-focused, strengths-based approach in the practice of the
alternative school as evaluated by the perceptions of the teachers, administrators and staff. The solution-focused orientation is thought to be an integral part of the school’s educational practices.

The final pattern matching (see Figure 5) indicates what students thought were important in helping them achieve academically were clusters that centered around relationships. This finding is consistent with Rumberger’s (2004) study that identified effective alternative school programs for dropout prevention have a non-threatening environment for learning, and a school structure that provides a low student-teacher ratio and a small class size in order to promote student engagement. Results from this final pattern matching also indicate that teachers, administrators, and staff rated more concrete aspects of the school and goal-setting as being important. This too is consistent with Rumberger’s (2004) study that noted the importance of a caring and committed staff who accept personal responsibility for student success and a school culture that encourages staff risk taking, self governance, and professional collegiality.

Through this concept mapping analysis, administrators, staff, teachers, and students identified a sense of community and unique organizational practices as being important factors in helping students achieve their academic goals. The use of solution-focused techniques were also rated as important in building relationships and helping teachers and administrators offer program options that made a difference to the outcomes of students. Franklin, Streeter, Kim, and Tripodi (2007) note how SFBT offers a specific set of solution-building skills that are associated with improving positive outcomes for at-risk students.

How the Concept Mapping Information Was Used

This example of concept mapping produced information about how to help at-risk youths succeed academically. Specifically, information gathered was used in the school’s program
planning and evaluation activities in several ways. First, they were able to see which program components seemed to be most important and to what groups within the school. The fact that students rated relationships and school culture the highest was instructive in how to designate resources to keep the relationship focus alive within the school and to justify these resources to the school district. Since solution-focused techniques seemed helpful and integrated into the school, more resources were requested and allocated for additional solution-focused training and a new plan to include the students in the solution-focused training was implemented.

Administrators were also able to use the information generated from the concept mapping in several ways such as strengthening some of the program features that were suggested to be most helpful and eliminating others that are not so helpful. They were also able to use the information to show the school district what was working and to ask for more personnel to support the unique features of the program (e.g. teacher training, more counselors and social workers). Finally, the information supported the effectiveness of the schools’ programs from several different perspectives and this was extremely positive information that could be shared with parents, school district, and the community at-large.

There are some limitations of using concept mapping that should be noted. Because we were working with a relatively small, non-random sample, our results may not be generalizable. Also, using a group process to gather information has its limitations in terms of people may not be able to voice their true opinions out of fear. Another issue that arose from our case example has to do with the large number of statements generated in the brainstorming phase. Participants had a large number of statements (n=182) that they had to sort and rate which was time consuming. Ideally the brainstorming session should set a limit of 80 statements or less so it is more manageable for participants to sort and rate them (Kane & Trochim, 2007).
Conclusion

Concept mapping appears to be a useful program evaluation methodology for school social workers to consider and a valuable tool for examining complex problems and solutions within school organizations. The school program discussed in this example was able to evaluate the most important program features from many different viewpoints, and take confidence in the program components that appeared to be an important contributor to their success. They were also able to assess their differences especially in relationship to their consumers, which in this case happened to be at-risk, high school students. Areas of disagreement on what was effective in their program between students, faculty and staff provided opportunities for goal setting and facilitated discussion that made concept mapping particularly useful for future program planning.
References


Figure 1. Deciding on Number of Clusters

Cluster Replay

Cluster Replay From 20 To 8 Done

Cluster Replay Listing
At Cluster 19 merged: 16 17
At Cluster 18 merged: 8 9
At Cluster 17 merged: 5 6
At Cluster 16 merged: 10 11
At Cluster 15 merged: 4 5 6
At Cluster 14 merged: 7 8 9
At Cluster 13 merged: 12 13
At Cluster 12 merged: 1 2
At Cluster 11 merged: 19 20
At Cluster 10 merged: 12 13 14
At Cluster 9 merged: 16 17 19
At Cluster 8 merged: 3 4 5 6

Figure 2. Cluster Bridging Map
Figure 3. Pattern Match Unique vs. Importance

Uniqueness vs. Importance

- Cutting edge
- School size and structure of school day
- Empowering culture
- Sense of community
- Admission and exit
- Continuous improvement
- Student success
- Student-student interaction
- Respect evident throughout the school
- Organizational foundation
- Relationships
- Strengths-based
- Professional environment
- Professional culture
- Resources directed to student success
- Preparation for life

$\text{r} = 0.28$

Figure 4. Pattern Match Importance vs. Solutions

Importance vs. Solution

- Respect evident throughout the school
- Sense of community
- Relationships
- Strengths-based
- Student-student interaction
- Continuous improvement
- Student success
- Empowering culture
- Professional environment
- Organizational foundation
- Admission and exit
- Preparation for life
- School size and structure of school day
- Resources directed to student success
- Preparation for life

$\text{r} = 0.72$
Figure 5. Pattern Match Importance- Teachers vs. Students

Importance- Teachers/staff vs. Students

<table>
<thead>
<tr>
<th>Teachers</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.26</td>
<td>4.26</td>
</tr>
<tr>
<td>3.47</td>
<td>3.47</td>
</tr>
</tbody>
</table>

- student-student interaction
- sense of community
- respect evident throughout the school
- empowering culture
- preparation for life
- strengths-based
- organizational foundation
- Professional environment
- school size and structure of school
- cutting edge
- continuous improvement
- resources directed to student success
- admission and exit
- student success
- relationships
Appendix 1. Statements by cluster

Cluster 1 Relationships

1) Facilitators act as student advocates and students are encouraged to openly communicate with facilitators

135) Staff has moral commitment to guide students' development

110) Principal knows all students on a personal level

92) Principal knows students' names

24) Principal asks for input from student advisory cabinet in decision making

94) Respect for professionalism

141) Natural (authentic) peer mentoring among staff

111) Principals take time to get to know students through an initial interview

Average Bridging = 0.30

Cluster 2 Professional Environment

61) Staff's strength of belief and commitment supercedes a need for recognition or approval by others

133) "Administrative staff is skilled, fearless, and share school's vision"

76) Administrators are solution-builders not disciplinarians

60) Staff are more honest about opportunities

45) High expectations for staff

38) Administration is a strong team comprised of people with different strengths

65) Multiple opportunities for meaningful staff development

70) Facilitators practice the depth and breath of their disciplines that allows flexibility

68) Administration questions old practices and acts to consistently preserve school's mission

Average Bridging = 0.51

Cluster 3 Respect Evident Throughout the School

164) Students treated with respect by teachers

176) Students treat teachers with respect

162) "Students get to know teachers, counselors, administrators, and staff on an individual basis"

139) Positive relationship between students and staff that develop trust

7) Students feel comfortable seeking staff assistance when having a problem with another student or staff

46) Students are trusted by staff

44) Staff is trusted by students

120) Teachers talk with students

42) Establishment of trust

118) Any student can ask to talk with any staff member at any time

83) Mutual respect replaces authoritative power structure

95) Staff helps to create genuine environment of affection

12) Staff and students are allowed to be themselves

Average Bridging = 0.12
Cluster 4 Strength-Based

130) Natural (authentic) individual student mentoring by staff 0.15
147) Creativity is fostered for students and staff 0.15
149) Students have an incentive to graduate because they see graduation as attainable 0.16
161) Students learn that they will be rewarded for giving 0.16
163) Staff and students are encouraged to take risks (failure is viewed as learning experience) 0.17
57) Wellness period provides students and staff with opportunities to play together in various activities 0.19
28) Staff is understanding about absences 0.19
178) Decisions on students’ needs are developmentally appropriate 0.20
27) Student-teacher meetings instead of parent-teacher meetings 0.22
104) Traditional educational power struggles are minimized or eliminated 0.24
67) Needs of the whole student are addressed/receive attention 0.28
21) "Thoughtful, individualized, personalized matching of students with staff and curriculum" 0.35
115) "If students are missing from school for several days, they receive phone calls and a home visit from caring staff, not truant officers" 0.36
134) Mixed educational philosophies 0.37
93) Parent involvement 0.38
66) Fearlessness and discernment in deciding what's in the best interest of students 0.45

Average Bridging = 0.25

Cluster 5 Sense of Community

167) Students are recognized as decision makers 0.05
166) Students are known by name not by a number 0.05
112) Minimal hierarchical social atmosphere 0.06
119) Engagement - students are given ownership and responsibility 0.07
151) Nurturing and emotionally responsive environment 0.07
113) High touch (appropriate/good) affectionate environment 0.08
160) Natural consequences are used to help students learn about cause-effect relationships and life 0.08
34) Everyone knows everyone else (students and staff) 0.10
8) Minimal verbal altercations addressed by positive interventions 0.11
123) Garza is like a family 0.12
146) Collegiality and strong sense of community 0.13

Average Bridging = 0.08

Cluster 6 Student-Student Interaction

128) Acceptance of differences 0.00
Students are able to interact with students from many different backgrounds which promotes acceptance.

Students respect each other.

"Respect for differences in general (i.e. ethnicity, social orientation, academic progress, age, economic status, etc.)"

Students get to know classmates well and interact more with each other.

Students are loyal to the school and protective of other students and the school environment.

Everyone is accepted regardless of background differences.

Friendships among students from different backgrounds and experiences.

Students respect the campus and code of honor.

Students become more independent and confident because given more personal responsibility for their success.

Empathy for peers who are experiencing a hard time.

Natural (authentic) student peer mentoring.

"Respect for differences in general (i.e. ethnicity, social orientation, academic progress, age, economic status, etc.)"

"Everyone at school follows code of honor that includes respect, integrity, peace over conflict, and finding personal peace"

Students do not have fights.

No cliques so students are seen as individuals.

Students are mature.

Absence of physical fights and violence.

Average Bridging = 0.11

Cluster 7 Empowering Culture

Minimal social competition.

Students assume responsibility for their own educational progress and direction.

Students need more self discipline to succeed at Garza because they are given a lot of freedom.

Casual environment.

Stress free environment.

Students are intentional in creating and sustaining a positive learning culture.

Choice creates personal investment.

Focus on unlimited possibilities.

Students are given clear expectations.

"Students are not given suspension but "reflection" when they do something wrong"

"Students can eat, drink in class, listen to music in class"

Don't have to raise hands to leave classroom.

School of choice for both students and staff.

Students are welcome to stay at school when their classes are over.
"Garza is not an alternative school but a progressive, non traditional school where students choose to attend"

No dress code

"Code of honor is simple with three points, including no violence, respect yourself and others"

Students have freedom to leave campus at any time

"Garza is a small school (about 500 students), which allows everyone to be close with each other"

Cluster 8 Cutting Edge

Students take one course for 4 hours a day at a time

Students take fewer classes each day (1 or 2 per day) than at other schools

Year round school schedule that allows for frequent breaks

Year round extended day to meet student needs

Open enrollment and open exit

Self-paced academic progress

Flexibility in scheduling

No report cards or progress reports

Homework is an option for students but is not required (work is done only in the classroom unless the student decides otherwise)

Self paced curriculum

Enrollment based on 10 credits or more

Students have to have 10 credits from another high school to get into Garza

Age does not determine whether students are admitted to Garza (only number of credits)

Cluster 9 Organizational Foundation

"Students are not organized into classes (Freshman, Sophomore, etc.). Progress is determined by number of credits."

"Self-directed, non-competitive academic environment"

Student-centered application of state and district mandates

Students complete more academic credits here than those at other high schools

Students get to choose the classes they take and the order of the classes

Every student has an individualized education plan

Students have structured choices on curriculum content

Class work is not overwhelming

Low student/counselor ratio

Structured orientation provides an introduction to the school's culture

"During a week-long Blue Prints orientation, new students get explanation from other students about how the school operates and
behavior expectations, code of honor"

Students don't have to pay to attend Garza 0.27

Average Bridging = 0.21

Cluster 10 School Size & Structure of School Day

Lunch hour is flexible 0.22
Students can take as long as they want to finish projects - no deadlines 0.24
Small class size 0.25
All students are not at school at the same time because of scheduling differences 0.25
Many students have family or work responsibilities outside of school and the school caters to their needs 0.26
No school bells indicating start or class 0.26
Students choose time to attend classes 0.27
No sorting or selecting 0.29
"Physical structure of classroom- no desks, round tables in cafeteria" 0.45
Small school 0.49

Average Bridging = 0.30

Cluster 11 Admission and Exit

Students spend more time studying and do higher quality work at Garza than students at other high schools 0.29
Entrance portfolio begins in orientation and is foundation for exit portfolio; it allows the student to consider why they came to Garza and introduces them to the code of honor 0.36
Credit analysis is provided by registrar during application process and is reinforced by counselor 0.39
Students can substitute classes if they've already covered the material 0.40
Infusion of technology across all classes 0.40
Students are informed about opportunities to achieve credits 0.40
Students complete a minimum of 20 hours of community service prior to graduation 0.49
Academic portfolios are used as an authentic assessment of students' demonstration of what they know 0.49
Exit portfolio is a cumulative reflection of students' achievements 0.61

Average Bridging = 0.43

Cluster 12 Resources

Garza has college fairs 0.36

TAAS/TAKS tutoring (student chooses tutor and time during the school day) 0.38
CIS- communities in schools provides a wide range of social services and the services are integrated 0.38
Garza has more scholarships and free classes than other schools 0.40
Class on criminal justice that teaches students the penalties associated 0.40
Evaluating a Public Alternative School Program

with doing drugs
170) Students get help with resume writing 0.41
63) Students can return after graduation to take classes and use school's resources; GIR (graduates in residence) program for students who have graduated 0.43
25) "Two dedicated staff positions (Parent Involvement Specialist and Outreach Facilitator) to deal with students who have special circumstances, such as teen parents, students with poor attendance, and students with medical problems " 0.44
10) "Tailoring curriculum and services (i.e. job placement, college/career/personal counseling, day care, job fair) to meet individual student needs (focus on individual) " 0.50
4) Equitable access to resources 0.51
96) Inter-disciplinary curriculum development 0.51
30) "No sports teams, so all money is spent on the students to help with educational programs, scholarships" 0.53
52) "Many ways to earn community service hours (VIP club, Garza Green, soup kitchens, food drives, massage classes, babysitting, or student's choice of community service activities)" 0.56
39) Vending machines are always on and working properly 0.57
98) Exit portfolio demonstrates evidence of success 0.65
47) Geographic location 0.67

Average Bridging = 0.48

Cluster 13 Preparation for Life
131) Garza has many job fairs and students are encouraged to look for work while in school 0.29
143) Equal opportunity and encouragement for dual enrollment (ACC Early College Start) 0.35
31) "Counselors give students vouchers so they don't have to pay fee to take standardized tests (SAT, ACT)" 0.42
172) "School has a program to address any problem a student has (i.e. CIS, day care, groups such as Rainbow group, phenomenal women group, relationship group, Kit Kat group)" 0.49
29) Staff recommend that students take classes at ACC 0.49
102) "Garza offers assistance to students who have graduated - students can return to use services (counseling, etc.)" 0.51
157) Special effort to assist teen parents 0.55
142) Students are encouraged to use CIS 0.57
177) CIS provides a safe environment for students 0.61
99) Resources are used primarily for instruction and support services 0.67
53) Staff and students have abundant resources 0.74

Average Bridging = 0.52

Cluster 14 Student Success
174) "Daily, weekly, and yearly goal-setting that involves students" 0.26
156 ) Star walks allow individual student recognition when they graduate 0.27
26 ) Star walks- public recognition and celebration of individual success and passages 0.32
180 ) Students are encouraged to think about their future (in terms of college and employment) 0.34
152 ) Meet special students' needs through mainstreaming and team approach 0.37
138 ) Goals are revisited and revised 0.43
159 ) "Active partners in education membership (volunteer time, PR)" 0.54
36 ) "Physical plant (i.e., cleanliness, bright rooms, lots of plants/flowers)" 0.55

Average Bridging = 0.39

Cluster 15 Continuous Improvement
153 ) Focus on sound practice and research 0.62
182 ) Staff considers individual students' situations in designing curriculum 0.68
40 ) Freedom to experiment with and modify curriculum continually 0.74
32 ) Help students understand life is a journey and they will apply what they learn here after graduation 0.77
80 ) Creating exit portfolio often confirms other people's feelings of the student's self worth 0.93
33 ) The exit interview provides opportunity for staff to self-evaluate work 1.00

Average Bridging = 0.79