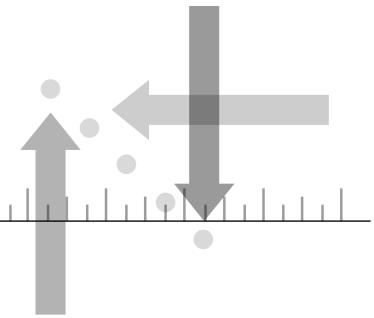


CONCEPT MAPPING

Purpose

Concept mapping is a method used to make a visual representation (that is, a picture or a map) of concepts or ideas and to illustrate their relationships. Terms such as *mind map*, and *idea map* are essentially synonymous with the term *concept map*. A similar method, *cluster mapping,* additionally uses statistics to define clusters of similar items.

Needs Assessment Applications

In the context of needs assessment, concept mapping can be used for various purposes, including data collection, consensus building, and decision making. Specifically, they can be used for the following:

- Facilitate discussion and data collection during interviews or focus groups.
- Support decision making between potential solutions for a given gap.
- Engage in pattern matching for the purpose of consensus building in relation to need identification.
- Identify organizational priorities.

Concept maps can be created by either a single person or a group of people. In the case of a single person creating a concept map, the purpose might be to identify the key ideas relative to a given problem. When concept mapping is used in a group setting, its purpose can be to identify and show the relationship between units within an organization, to brainstorm ideas or solutions, or to systematically identify priorities or plan new approaches.

The key purpose of a concept map is to visually represent key elements and their relationships. This visual representation can be especially useful when complex relationships exist between elements. Concept maps generate qualitative data, but the data can be interpreted using both qualitative and quantitative data analysis.

Advantages and Disadvantages

Advantages

- Concept mapping represents ideas or views from a large group of participants or stakeholders in an easy-to-interpret format.
- It generates data that can be interpreted qualitatively or quantitatively.
- It identifies complex relationships between issues, factors, and so on in a tangible, graphic format.
- Because it is participant focused, everybody can have his or her ideas represented.
- It shows at a glance specific performance areas, their interrelationship, and their strategic priority.
- It is simple to implement and understand for both you and the participant(s).
- Concept mapping uses a structured process that can be replicated easily and reliably.
- It enables the organization to create a shared vision of performance areas and goals.
- It promotes active participation and, therefore, ensures that participant(s) stay on task.
- It can be done using computer software or using paper.

Disadvantages

- In the absence of a structured approach for creating concept maps, this approach can become messy and hard to read.
- Concept mapping includes only a high level representation of the performance area that is the subject of the concept. This method does not easily allow for the inclusion of detailed information.

- In concept mapping, it may be hard to identify all the relationships between the concepts or ideas.
- Interpretation of the concept map data can be involved.
- The use of this method may require an experienced facilitator.

Process Overview

The three main phases of the concept mapping technique are planning, gathering information, and analyzing and interpreting.

Planning

1. Determine the focus of the concept map by using the list of information required for the needs assessment.
2. Identify the data analysis methods to be used after the concept map has been completed.
3. Identify and invite participant(s) to build the concept map.
4. Establish the schedule for the concept mapping session(s).
5. Acquire resources required to conduct the concept mapping session.
    a. If technological methods will be used, acquire concept mapping software, a computer, and a projection device (for example, a video projector) along with a projection surface or screen.
    b. If nontechnological methods will be used, ensure that you have access to a large surface area on which you can create the concept map, as well as thick markers in various colors, tape, and so on.
    c. If you are doing the concept mapping session with a large number of participants, consider identifying a colleague or assistant who is able to create the actual concept map while you (or a hired facilitator) mediate the session.

Gathering Information

1. Start the concept mapping session by introducing the purpose and focus of the concept map to the participant(s).

a. If the concept mapping session is being conducted with a large number of participants, then identify "rules of play" and other information related to the group process.

2. Begin the brainstorming process, encouraging participants to identify as many performance areas as possible related to the focus topic. Emphasize that this is the brainstorming phase of the process and, therefore, that all reasonable contributions are of value.

3. After brainstorming is completed, invite participants to identify redundant information in the list (for example, two contributions that refer to essentially the same thing). Merge and synthesize those instances to create a final list.

4. Begin the structuring process. The process can be started individually, at first, or as a group from the start.

   a. Ask participants to work individually to sort (group or cluster) these performance areas into clusters of their choosing (or use an individual card sorting technique). Beginning the structuring process individually offers individuals a chance to identify relationships among the performance areas before collaborating with the group to come up with a shared sorting of the listed items.

   b. Ask participants to work together to sort (group or cluster) the performance areas into clusters (or use a group card sorting technique). Beginning the structuring process as a group promotes a mediated process of consensus building to identify relationships between performance areas.

5. Items from the list are placed on a "map" (for example, drawn on a big piece of paper, or written on sticky notes that are placed on the wall) to illustrate their relationships. Clusters can be maintained from the previous list, or new clusters may be formed in keeping with the visual map that is developing. More complex maps can be created using statistical techniques and software; in those instances, you should consult the resources that follow.

6. Ask participants to work either collectively or individually to restructure the concept map by hierarchically laying out the concepts or clusters on the basis of one or more dimensions relevant to the focus statement. For example, arrange the items within each cluster by their feasibility within the organizational context. Work to build consensus among the group members on a final map that represents their shared perspectives.

Analyzing and Interpreting

There are different points at which the information captured in the concept map can be analyzed and interpreted. It can be interpreted during the actual concept mapping session (through the active involvement of the participants), after the completion of the concept mapping session (by you or by an external data analysis expert), or at both points. The timing of the analysis and interpretation of the concept map information depends on the purpose and nature of the concept map.

You can interpret data from a concept map in innumerable ways, ranging from "eyeballing" the concept map to determine key trends or priorities, to performing thorough statistical analysis to assess construct validity. For this reason, restrict yourselves to identifying just a few ways you can go about using your concept map data for needs assessment purposes.

Interpreting in-session data

When the concept maps are interpreted during the concept mapping session, consider actively involving the participants in the decision-making process. However, the extent to which in-depth statistical analysis can be done during the concept mapping session is very restricted. Most of the analysis you would do in session will fall into categories such as the following:

- ***Coding:*** Participants work with the facilitator to set up a simple coding scheme that is related to the focus area of the concept map. The group then works together to code concepts or clusters on the concept map according to the coding scheme. Trends in the concept map data can be analyzed by doing frequency counts on the prevalence of each of the code categories.
- ***Rank ordering:*** If participants have been asked to use a predetermined scale to rate concepts or clusters of concepts, then you may consider using rank ordering. In this case, you would ask all participants to report the rating they assigned for each cluster or concept. Add up the total rating values per cluster or concept (depending on the unit of analysis), and place the values in rank order according to a dimension relevant to the focus statement for the concept map.

Interpreting post-session data

Multidimensional scaling and hierarchical cluster analysis are two statistical analysis methods that are often used when a thorough understanding of the information in the concept map is required. In addition to those

approaches, however, several simple analysis approaches can be used after the concept mapping session has wrapped up.

Here are two examples:

- For decision making between alternate approaches for addressing a performance gap, you might ask participants to rate the cluster on the basis of feasibility or desirability. Then set up your own system—after the concept mapping session—to rate the clusters while using your expertise in the area of need (see figure 3B.4). By comparing the ratings you have given with those given by participants (that is, patterning), you can rank order the various approach clusters to determine the solutions that are most likely to succeed and to match the organization's preferences.
- To compare the views or insights of two different groups of stakeholders, again use an approach to identify patterns. In this case, you would ask the stakeholder groups to separately rate the clusters related to the concept map focus area. You would then analyze the concept maps by comparing how different stakeholder groups rated each of the clusters (see figure 3B.5). Clusters that are generally rated at the same level by each of the cluster groups would indicate a high degree of consensus between stakeholder groups. Clusters where ratings are very different would indicate divergence between stakeholder groups.

Examples

Figure 3B.4 Example of Basic Concept Map to Illustrate Relationships

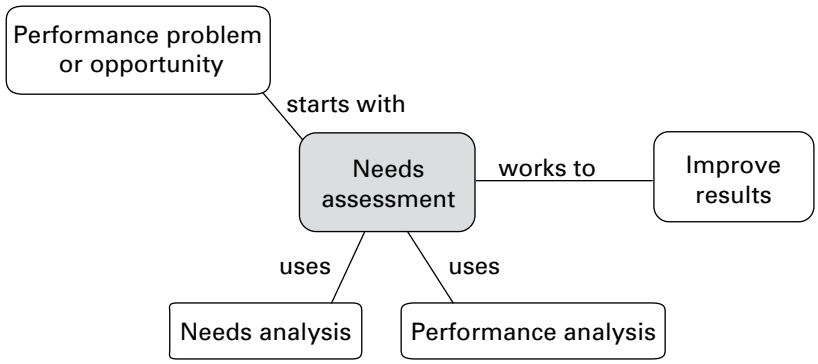
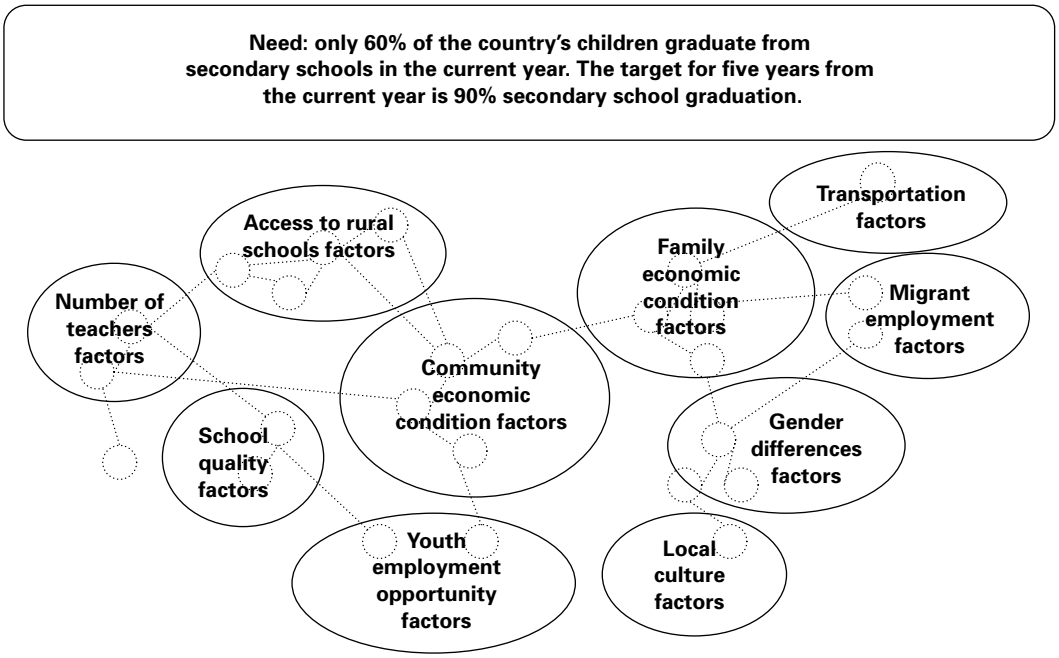


Figure 3B.5 Example of Basic Concept Map with Clusters Overlaid on Individual Statements



Tips for Success

- Be sure that you have clearly spelled out the focus area for the concept map prior to the concept mapping session.
- To increase the comfort level of the participants,
  - Explain the concept mapping process to them.
  - Reiterate that their names will not be directly tied to their contributions to the concept map (if applicable).
  - If the participant(s) in the concept mapping session have never worked with concept maps before, consider illustrating the process with a simple example.
- During the initial brainstorming session, include all contributions in the concept map.
- Do not worry about the look or structure of the concept map until the "structuring" phases of the concept map come around.

- Verbally repeat participants' contributions to the concept map as they express them. Doing so will ensure that the concept map is the most accurate reflection possible of the participants' contributions.
- If all participants will collectively work on clustering concepts, use simple strategies to make it visually easy to identify which concepts are being assigned to which clusters. For example, use the same color for all concepts assigned to the same cluster.

References and Resources

Jackson, Kristin M., and William M. K. Trochim. 2002. "Concept Mapping as an Alternative Approach for the Analysis of Open-Ended Survey Responses." *Organizational Research Methods* 5 (October): 307–36. http://www.socialresearchmethods.net/mapping/mapping.htm.

Trochim, William. 1989. "Concept Mapping: Soft Science or Hard Art?" *Evaluation and Program Planning* 12: 87–110. http://www.socialresearchmethods.net/research/epp2/epp2.htm.

Trochim, William, and Mary Kane. 2005. "Concept Mapping: An Introduction to Structured Conceptualization in Health Care." *International Journal for Quality in Health Care* 17 (3): 187–91. http://intqhc.oxfordjournals.org/cgi/reprint/17/3/187.pdf.

Weller, Susan C., and A. Kimball Romney. 1988. *Systematic Data Collection*. Newbury Park, CA: Sage Publications.

Websites

"The Complexity of Concept Mapping for Policy Analysis" by Trochim and Cabrera is available at http://www.isce.edu/ISCE_Group_Site/web-content/ISCE_Events/Cork_2005/Papers/Trochim.pdf.

"Using Concept Mapping to design an indicator framework for addiction treatment centres" is available at http://intqhc.oxfordjournals.org/cgi/content/full/17/3/193.

Additional Tools

Information on statistical analysis of concept maps can also be found in the following sources:

- Free software for creating concept maps is available at http://cmap.ihmc.us/.
- "Q & A: What Is Concept Mapping?" is available at http://www.socialresearchmethods.net/tutorial/Katsumot/conmap.htm.