DOCUMENT RESUME

ED 366 171 EC 302 775

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TITLE Consensus Building: A Process for Selecting Educational Outcomes and Indicators.
INSTITUTION Minnesota Univ., Minneapolis. Coll. of Education.; National Center on Educational Outcomes, Minneapolis, MN.
SPONS AGENCY Special Education Programs (ED/OSERS), Washington, DC.
PUB DATE Nov 93
CONTRACT H159C00004
NOTE 17p.; For related documents, see EC 302 768-774.
AVAILABLE FROM University of Minnesota, National Center on Educational Outcomes, 350 Elliott Hall, 75 E. River Rd., Minneapolis, MN 55455 ($5).
PUB TYPE Collected Works - Serials (022)
JOURNAL CIT Outcomes & Indicators: NCEO Report; n2 Nov 1993

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Cooperative Planning; *Decision Making; *Disabilities; Elementary Secondary Education; Models; Outcomes of Education; Preschool Education; *Student Educational Objectives; *Student Evaluation; Teamwork
IDENTIFIERS Consensus; *Consensus Models; *Multi Attribute Consensus Building; National Center on Educational Outcomes

ABSTRACT

The National Center on Educational Outcomes (NCEO) was established to work with states and other policy groups to develop a model of educational outcomes for students with disabilities and to generate a list of indicators of these outcomes. NCEO developed a technique named Multi-Attribute Consensus Building (MACB) to build consensus among educators, policymakers, administrators, parents, advocates, and other stakeholders. MACB is a quantitative, objective approach for determining a small group's opinion about the importance of each item in a list, through three stages: generation of input, consensus working session, and synthesis of consensus. NCEO produced large lists of outcomes and indicators and used MACB to determine how important these indicators were to various groups. NCEO used the ratings to determine which indicators and outcomes to use in the model at the school completion, postschool, and early childhood levels. Following a description of the MACB approach, this report discusses equipment needed, technical and logistical issues, ways to modify the MACB process, and advantages and limitations. Figures and appendixes present: (1) a conceptual model of outcomes; (2) MACB stages and tasks to accomplish; (3) a table showing decisions made during the process of synthesizing consensus; (4) a handout on the consensus-building process; (5) an example of an indicator's importance ratings spreadsheet; and (6) equipment configurations. (Contains 11 references.) (JDD)

Outcomes & Indicators

Number 2 NCEO Report – November 1993

Consensus Building: A Process for Selecting Educational Outcomes and Indicators

by Michael Vanderwood, James Ysseldyke and Martha Thurlow

In the decade since *A Nation at Risk* (National Commission on Excellence in Education, 1983), there has been a great deal of effort put into developing an evaluation system to provide educators, policymakers and the general public with information on the condition of public education. The search for this system has shifted from examining the process of education to identifying the desired educational outcomes of schooling and indicators of these outcomes.

By using outcomes and indicators, decisions about the educational system can be data-based, with the goal of improving instruction and student and system outcomes. Although there is an increasing national focus on outcomes and indicators, very little work has been done to identify outcomes for students with disabilities.

Because of this, the National Center on Educational Outcomes (NCEO) was established in October 1990, to work with states and other policy groups to develop a model of educational outcomes for students with disabilities and to generate a list of indicators of these outcomes.

In order to develop a useful and meaningful system for assessing the condition of education in this country, NCEO and others believed consensus needed to be created among various groups of stakeholders about the specific outcomes and indicators used in the model (Blank, 1993; Ysseldyke, Thurlow, Bruininks, Gilman, Deno, McGrew, & Shriner, 1992). Therefore, in its effort to develop a system of indicators, NCEO realized it had to use a process that would build consensus among educators, policymakers, administrators, parents, advocates, and other stakeholders.

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To identify the process it would use, NCEO reviewed several different approaches and decided to modify an evaluation system used in the management sciences.

Multi-Attribute Utility (MAU) analysis, is an evaluation model designed to facilitate decision making about several different options or alternatives. (See Lewis, Erickson, Johnson, and Bruininks, 1991, for detailed description of MAU.)

Using the MAU structure, NCEO created a consensus-building technique named ***Multi-Attribute Consensus Building*** (MACB). Through this process, outcomes and indicators were developed for the NCEO model at the school completion (Ysseldyke, Thurlow, & Gilman, 1993d) and post-school levels (Ysseldyke, Thurlow, & Gilman, 1993c), and for the early childhood levels at age three (Ysseldyke, Thurlow, & Gilman, 1993a) and age six (Ysseldyke, Thurlow, & Gilman, 1993b).

NCEO used the MACB process to help generate and reach agreement on the outcomes and indicators that are included in a model of educational outcomes (Figure 1). NCEO produced, with input from many individuals, large lists of outcomes and indicators and used MACB to determine how important these indicators were to various groups. MACB working sessions have been held with several groups of stakeholders. (For a more detailed description of the use of MACB at NCEO see Ysseldyke and Thurlow, 1993a.) After gaining input from these groups, NCEO used their ratings to determine which indicators and outcomes to use in the model. NCEO also produced a self-study guide to help states and school districts develop outcomes and indicators based on its model (Ysseldyke & Thurlow, 1993b).

Multi-Attribute Consensus Building (MACB)

MACB is a quantitative, objective approach for determining a small group's opinion about the importance of each item in a list. The group members begin by submitting items they believe should be included in the list.

Next, each member of the group rates the importance of each item in the list on a scale from 0 to 100. To create consensus, the facilitator presents each member's ratings and averages for each item, and then leads discussion around items that have a relatively large range or variance in ratings. Computer technology records ratings and calculates descriptive statistical information about the ratings. It can also be used to display changes to items that may be made prior to the rating of those items.

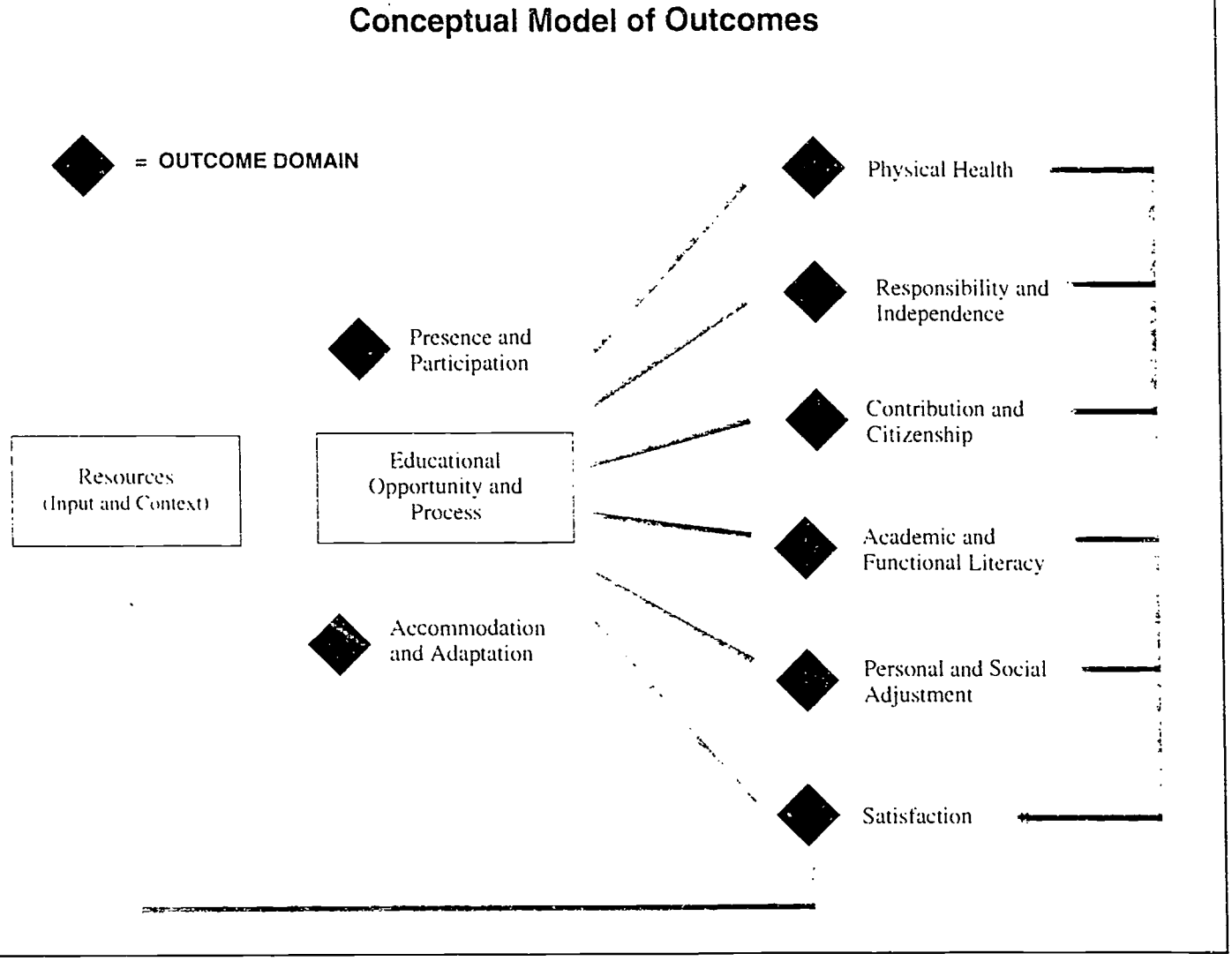
With this approach, discussion focuses on presenting and understanding various viewpoints regarding specific items about which members disagree. After hearing different viewpoints, members may change their ratings, giving an objective indication of the extent to which the group agrees on the importance of each item. The computer technology enables participants to view the effects of adjusted ratings immediately upon changing ratings.

Description of the Process

Three general stages are involved in using the MACB approach to identify outcomes and indicators: Generation of Input, Consensus Working Session, and Synthesis of Consensus. The three stages and the tasks that must be accomplished during each stage are shown in Figure 2.

Before beginning the process, a conceptual model that includes a basic framework of outcomes must be delineated for participants to give input on and for them to develop and come to consensus on a list of indicators of the outcomes. The framework that NCEO used is shown in Figure 1. NCEO's goal was to obtain input on the model and to have the participants

Figure 1



develop and come to consensus on a list of indicators of the outcomes.

Stage I: Generation of input

The purpose of the first MACB stage is to generate the indicators. Participants representing stakeholder groups need to be identified. NCEO recommends at least 4 but no more than 10 individuals be selected, contacted and asked to participate in a MACB working session.

Depending upon the purpose of the meeting, the group can be a mixture of several different types of stakeholders (e.g., parents, teachers, administrators) or it can be members from just one stakeholder group.

Although groups of more than 10 were used in some NCEO working sessions, discussion and group processing were quicker and easier to facilitate with groups of 10 or less.

After the participants are identified, the next step is to send them the current model with instructions to review it, write approximately four indicators for each domain, and return the list one week before the MACB stage II working session.

After all the lists have been returned, a master list for each area must be developed to include the respondents' lists, as well as indicators developed

Figure 2

Multi-Attribute Consensus Building: Stages and Tasks to Accomplish

Before the Process Begins

- Develop conceptual model
- Determine stakeholder groups – These should be groups influenced by the finished product.

Stage I: Generation of Input

1. Select 4 to 10 stakeholders to attend the working session.

2. Have stakeholders generate indicators for each outcome domain.

3. Develop a master list of indicators for each outcome area.

4. Create a spreadsheet shell that computes the average and range of the ratings for each indicator.

5. Prepare for stakeholder working session (e.g., make copies of ratings sheets, etc.).

Stage II: Consensus Working Session

Introduction
1. Explain purpose of meeting.
2. Describe MACB process.
3. Tell participants how information will be used.

Clarification
1. Present master list of indicators for one outcome domain.
2. Allow participants to make modifications to indicators if group agrees. Computer operator modifies master list.
3. Limit discussion to wording and meaning of indicators.

Rating
1. Participants rate the importance of each indicator (0 - 100).
2. One indicator must be 100.
3. Computer operator enters information into spreadsheet.

Discussion
1. Review average ratings for each indicator with stakeholders.
2. Discuss indicators with large ranges in ratings or mid-range average ratings (60 - 80).
3. Encourage revisions to ratings after discussion.

Stage III: Synthesis of Consensus

1. Compute standard deviation, median, and number of individuals who rated each indicator greater than 75 and less than 50.

2. Identify indicators with very high and very low average ratings. Keep those with very high ratings.

3. Make decisions about remaining unclear items. Use other indices and staff judgment to clarify the importance of the indicator.

by the staff or previous groups. The indicators should all be phrased in a similar format, eliminating duplicates on the master list. See Box A for a sample list that NCEO worked with during this stage.

Stage II: Consensus working session

It is in this second MACB stage that consensus building occurs. At least two staff members need to run the meeting, which can last from half a day to three days. The number of outcomes and indicators that need to be rated and the number of individuals who attend determine the length of the meeting. One staff member serves as the facilitator/moderator while the other operates the computer. Both members should be familiar with the outcomes and indicators, and any issues that may arise about them.

To ensure the success of the meeting, it is essential to explain in detail to participants the process and the purpose of the meeting. For example, the materials in Appendices A and B can be revised and given to the participants to help introduce the MACB process.

It is also important to mention how the collected information will be used. After this, the facilitator can introduce the first outcome domain and start the consensus-building activity with the group.

Consensus building consists of three parts: **clarification**, **rating**, and **discussion**.

During **clarification**, the facilitator presents the list of indicators to the group and asks for questions about the wording or about items individuals do not understand. Group members may modify the statements if the rest of the group agrees. The computer operator makes changes on the computer that is connected to an overhead projection display, allowing group members to see each change that is made. Discussion during this time should only be spent on clarifying the indicators and adding any that are considered necessary by the group.

One caution: The facilitator needs to prevent the group from focusing too much time on one or two words of an indicator. Clarification is the purpose here, not wordsmithing. And, the focus should be on understanding what is meant by the items, **not** on their merit. The "understanding" piece is important in this step. When members do not understand specific items, the facilitator can call on the person who contributed the item to explain what he or she meant, or ask the group to agree on the meaning of the item.

Following the clarification step, the facilitator begins the **rating** process. Every participant gives each of the indicators a rating from 0 to 100, where 100 represents the most important indicator. Participants must first assign the 100 rating and then rate all other indicators relative to this indicator. The only requirement is that at least one indicator must be considered the most important, although more than one may be rated 100.

Figure 3 is an example of a rating sheet with directions. On this sheet, space is provided for the participants to write down the items they are rating. Two alternatives to writing the items are:

- Continue to display the indicators, using a second computer and panel
- Print out lists of the modified indicators before beginning the rating process.

As participants complete the rating sheet they give it to the computer operator, who enters the ratings into the spreadsheet on the computer, checks to make sure that each participant has rated at least one indicator 100, and sees that all participants have rated all indicators. By doing this, the data entry process can be finished almost immediately after the last sheet is received.

The computer displays the spreadsheet with each member's ratings, the group's range, and the average for each

Box A

List of Indicators Used for Consensus-Building Process

at School Completion Level for Accommodation-Adaptation

A.....Percent of individuals who have mastered accommodation-adaptation or compensation skills required to move about in their environments (e.g., use a wheelchair).

B.....Percent of individuals who have mastered accommodation-adaptation or compensation skills required to communicate orally or in writing (e.g., use a communication board).

C.....Percent of individuals who have mastered accommodation-adaptation or compensation skills required to read (e.g., Braille, tape recordings).

D.....Percent of families who make necessary adjustments to enable their child to access educational opportunities (e.g., use community agencies, hire a tutor).

E.....Percent of individuals rated as demonstrating behaviors acceptable to their environments (e.g., home, school, and community).

F.....Percent of individuals who appropriately generalize information across settings.

G.....Ratings of the level at which family members are able to pursue their own activities.

H.....Percent of individuals who have mastered skills required to perform vocational, daily living and academic tasks.

I.....Percent of families who indicate after the student exits school they are sufficiently prepared to cope with student's disability.

J.....Percent of individuals whose parents actively participate in the IEP meeting.

K.....Percent of students and families who are knowledgeable about resources and programs in the community that will be needed after student leaves school.

Figure 3

Example of an MACB Importance Rating Sheet

Assigning Importance Weights to Indicators of Outcome Domains

Outcome Domain:

Your stakeholder group has identified, modified, and confirmed a consolidated set of measurable indicators for the outcome domain listed above. Read over the indicators and if necessary write them below using their assigned codes (A, B, etc). Once this is accomplished, do the following:

1) Assign the indicator(s) that you believe is (are) the most important a value of 100 points; and then,

2) Rate each of the other indicators on a scale of importance from 0 to 100 points.

Please note: It is permissible to assign more than one indicator a value of 100 points.

Indicator	Value
A	
B	
C	
D	
E	
F	
G	
H	
I	
J	
L	
M	
N	

indicator. Appendix B includes an example of the spreadsheet used by NCEO. This format can be created with most spreadsheet software (e.g. EXCEL, Lotus 123, Quattro).

After all ratings are entered into the computer, the group's ratings are displayed on the overhead projector. From these, the facilitator helps to create group **discussion** about those indicators that have a large range and a high degree of variability in ratings.

Those who have given low or high ratings on a specific indicator are asked to describe why they rated the item as they did. This is done especially with those individuals who have ratings that could be considered "outliers" (ratings outside the typical range). If it appears that all members are in general agreement about a specific indicator, discussion is not required and best to avoid in the interest of saving time.

Throughout the discussion process, the facilitator encourages participants to feel free to change their ratings after hearing other opinions. This step is a very important part of the process. Therefore, the facilitator must keep the discussion focused on the indicators that have discrepancies in ratings. After discussing these indicators, the facilitator moves on to the next domain and begins the clarification process. This three-part procedure continues until consensus is reached for all domains.

The dialogue in Box B represents what the facilitator might do and say to generate discussion after ratings have been displayed. Note that the "outliers" and other group members have the freedom to change or not change their ratings.

Stage III: Synthesis of consensus

After the working session comes the final stage of MACB, which completes the final selection of indicators. The selection process is generally based on the data, but for borderline cases, the decision should be based upon statements made during the rating process and other factors concerning the indicator (such as feasibility of use or similarity to other indicators already chosen).

Several different indices of central tendency and variation can easily be produced using spreadsheet formulas. Along

Box B

Sample Dialogue

About Indicator with an Average Rating of 75, with a Range from 0 to 100

Facilitator: *Indicator C received an average rating of 75. But the ratings ranged from 0, given by two people, to 100, given by three people. Both Mary and Joe rated C as zero. Mary or Joe, or both of you, please tell us why you gave Indicator C a zero rating.*

[Mary and/or Joe speak]

Facilitator: *Okay, how about you George, or you Stephanie, why did you rate C as 100?*

[George and/or Stephanie speak]

Facilitator: *Those are all good points. Does anyone else want to make a statement? Or, does anyone want to change a rating after hearing the discussion?*

Box C

Sample of Decisions Made During Process of Synthesizing Consensus

Indicator	*Avg*	*SD*	*Min*	*Max*	*Med*	*%>75*	*%<50*	*Decision*
A	65	30	0	100	65	50	50	Drop
B	98	4	90	100	100	100	0	Keep
C	94	8	75	100	98	100	0	Keep
D	79	22	50	100	90	57	29	Drop
E	28	20	0	50	35	0	100	Drop
F	88	35	0	100	100	86	14	Keep
G	**73**	**30**	**10**	**100**	**83**	**63**	**25**	**Keep**
H	14	26	0	80	0	13	88	Drop
I	99	3	90	100	100	100	0	Keep
J	**75**	**37**	**10**	**100**	**85**	**63**	**25**	**Drop**

Note: Indicator J was dropped while Indicator G was kept even though the ratings for both indicators were very similar. Staff judgement determined that indicator G was important to keep because it was part of an already existing data base that would provide information on the outcome.

with the standard deviation, median, range, and mean, NCEO suggests using the percentage of individuals who rated an indicator higher than 75 and the percentage who had ratings lower than 50 as useful indices of a group's consensus on a specific indicator. These statistics will help decide which indicators to keep and which to drop.

Although complex combinations of statistical criteria could be used to direct decision making (Lewis et al., 1991), NCEO's experiences from numerous working sessions suggest that a simple approach is quite adequate for making good decisions. Basically, NCEO examines the average ratings to make the first cut on indicators.

The general rule is to keep items with high average ratings (above 90) and drop those with low average ratings (below 50). When it is not clear whether to keep or delete an indicator, the decision should generally be based on the data, but when the data are not clear, a judgment must be made by the staff.

The sample of decisions in Box C provides an example of the decisions made for a set of indicators that were rated by a group and summarized using a spreadsheet program.

Equipment

One of the unique features of MACB is the use of a combination of equipment: computer, spreadsheet and word processing software, overhead projector, and a computer display projection panel to expedite the consensus-building process and provide feedback to the stakeholder group. Different combinations and configurations are possible. See Appendix C for descriptions of several IBM and Macintosh-based systems. When creating a system, however, it is important to test the equipment before conducting a MACB working session since what "should work" does

not always work. After choosing a spreadsheet program, also listed in Appendix C, gain experience and familiarity with the selected program to ensure successful use.

Technical and Logistical Issues

When determining which type of computer to use, several factors must be considered.

First, the computer must be able to connect to a display panel that allows the computer screen to be displayed through an overhead projector onto a projection screen. Some computers come equipped with video output ports, while other computers need to have a card or cable installed to make them ready for use.

Second, meeting facilitators and computer operators need to be familiar with the chosen software and the computer. The MACB working session computer operator needs to know how to solve problems that might arise, and be very adept at entering, changing and saving text and data.

The speed of the computer is the third factor that must be considered. Although a fast computer is not essential, the process can become painstakingly slow if it takes an extraordinary amount of time to enter data and update the display.

Fourth, the physical set-up of the room needs to be considered when preparing to hold a MACB working session. The computer equipment might interfere with the participants' view of the screen(s). Also, participants should be seated in a way that will promote group discussion. Thus, all participants should be able to see and hear each other.

Ways to Modify the Process

Consideration should also be given to ways to modify the MACB process to best suit the situation in which it will be used.

One way to modify the process is to increase the number of computers and panels. MACB works very well with only one computer and panel, but by using two computers, panels, and overhead projectors, the indicators and the ratings can be displayed simultaneously. With two computers, the participants do not need to write down the indicators before they rate them. Two computers are especially useful when the amount of time is limited.

Another way to modify the process is to eliminate the computers. Instead, the indicators and ratings can either be written and modified on paper or on a chalkboard. Of course, this method of computing ranges, and group and individual average ratings slows down the process and makes it more difficult to change scores. But if computers are not available, this process still works effectively to build consensus.

The paper and pencil approach can also be used in a modified MACB process conducted via the mail. This method is very similar to the Delphi technique (Dalkey, 1967), but less time consuming and more objective. Besides rating items, participants write their reasons for each rating, and mail them to the facilitator who processes all the information onto a summary form.

Each participant receives this form that contains means, standard deviations, ranges for items and comments of the entire group, as well as the individual's original ratings. Each participant reviews the form and makes changes to the material or leaves it unchanged before sending it back to the organizer. These ratings are used to decide which indicators to keep and drop.

Unfortunately, this approach loses the possibility of viewing the effects of changed ratings and eliminates the opportunity for further re-rating. But it provides an alternative for consensus building with large groups where it is impossible to bring participants together for a meeting.

Other Uses of the Process

MACB is well suited for any type of group decision making that requires developing a list and then selecting specific items from the list. Although NCEO has only used this process in selecting educational outcomes and indicators, MACB has been used by others to help define and select research priorities, to identify educational outcomes of university graduate level training programs, and to facilitate strategic planning by identifying critical educational issues in the next 20 years.

Advantages/Limitations

When compared to other consensus-building processes, such as the Delphi technique, three MACB features stand out as unique and especially useful.

First, in the MACB rating procedure, everyone has equal input into the final decision and an opportunity to detail why they rated an indicator a certain way.

Second. the MACB process keeps discussion focused on the topic at hand. Consequently, the important points of the issue are more often addressed in detail than with other methods. Also, by asking the group to focus on the ratings, the facilitator has an easier time getting the discussion back on track.

A third advantage of MACB is that participants enjoy the process and are generally satisfied with the final product.

MACB has several limitations that need to be recognized by those planning to use the process. As with any type of rating system, MACB is susceptible to different response styles of the participants. For example, individuals may use different reference points when giving their ratings, always respond in a similar fashion, or only use a certain part of the scale.

Another limitation is that groups often spend a large amount of time attempting to reword the indicators because they are easily modified on the computer. Modifying an indicator is important if the meaning becomes clearer to the group. However, discussion should generally focus on the ratings and why one person rated an indicator differently from another.

The final limitation of the MACB process is that strong believers can sometimes dominate conversation and prevent others from participating as fully as they desire. One solu tion to this problem is to provide participants with a form for writing down their final thoughts, concerns, and reservations about any indicator, and encourage them to use it.

Conclusion

For NCEO, the MACB process has been invaluable for reaching consensus about important educational outcomes. With it, NCEO has brought together individuals from very diverse perspectives (e.g., legislators, school administrators, parents, general educators, special educators) to reach agreement.

The MACB process promotes a focus at an objective level, even when the issues being discussed are quite value-laden. And, after completing the process, the participants support the product they have produced, and the implementation and dissemination of the results. ◆

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APPENDIX A. Explanation of Consensus-Building Process

Consensus-Building Process for Identifying Outcome Indicators

Multi-Attribute Consensus Building (MACB)

The Multi-Attribute Consensus Building (MACB) process will be used to reach agreement on indicators within each outcome domain. This process is a modification of the Multi-Attribute Utility analysis procedure that has been used to analyze policy in management sciences, public health, and other social services needing to structure decision making for evaluating program alternatives.

What Are We Going to Do?

MACB contains three distinct stages:

1) generating indicators
2) rating indicators
3) selecting indicators

When you sent your modification to the current list of indicators, you had completed the first stage. The second stage will occur during the meeting that you are attending. Our goal is to discuss the indicators and then to rate them.

The discussion and rating process is fairly simple. We will work with only one domain at a time, using computers to aid the revision and rating process.

First we will display the list of indicators that we have compiled from our previous list and your additions. Then we will ask for feedback on the clarity of the indicators, modifying the list as needed.

After this brief discussion, you will identify the indicator that you think is most important and give it a rating of 100. Next, you will rate the remaining indicators in importance from 0 to 100, relative to the indicator given the 100 rating. Additional ratings of 100 may be given at this time.

Note: You must give at least one indicator a rating of 100 in each domain.

After the indicators have been rated and entered into the computer, they will be displayed for the entire group to view (see attached sample). As a group, we will examine the average rating and range of ratings for each indicator.

Discussion will begin with indicators for which there does not seem to be consensus. At the end of this discussion, everyone will have an opportunity to change their ratings based on what they hear in the discussion. This procedure will be repeated for each domain.

The third stage of the consensus-building process will occur after the meeting. We will examine the ratings that you have produced and use the mean rating for each indicator and other statistics to help decide which indicators are retained.

We will look at the following indices when making decisions: mean rating, median rating, standard deviation of ratings, range of ratings, number of people giving a rating above 75, and number of people giving a rating below 50. ◆

APPENDIX B: Example of Ratings Spreadsheet

Indicators

Domain: Compensatory and Accommodation Skills – Grade 8

A. Percent who have mastered skills required to move about in the environment (use of wheelchair, cane, etc.).

B. Percent who have mastered skills required to communicate with others (use of sign language, symbol board, etc.).

C. Number or proportion who comprehend and use age-appropriate communication skills.

D. Proportion who are able to independently use public transportation (if available in their community) for business or personal use (e.g., shopping, recreation).

Importance Ratings Spreadsheet

Compensatory Grade 8

	JC	SL	TY	JS	MV	BS	KK	LO	MT	KL	Avg	SD	Min	Max	Med
A	90	85	95	85	100	95	100	80	95	90	92	63	80	100	93
B	70	50	95	90	70	80	70	72	80	80	76	12	50	95	76
C	90	100	100	98	100	100	98	98	100	100	98	29	90	100	100
D	20	0	80	30	40	50	21	39	40	23	34	20	0	80	35

APPENDIX C. Equipment Configuration

Several different types of computer, cable, and panel configurations can be used to project computer displays through an overhead projector. The number of different options and types of equipment and software available increases the complexity of finding components that are compatible. NCEO has used a number of different configurations and the ones that worked are listed here.

Computer	Cable/Connector	Panel
Macintosh Plus with A10 adapter NOTE: Very slow system	9 pin to 15 pin	Infocus 480GS
Macintosh Classic with A21 adapter	9 pin to 15 pin	Infocus 480GS
Macintosh Powerbook 160 or 180 with Video Output port	15 pin to 15 pin	Infocus 480GS
IBM or compatible 386 or 486 Portable with Video Output Port	15 pin to 15 pin	Infocus 480GS

Software

There is a large variety of word processing and spreadsheet programs that can be used. NCEO has used: Microsoft Word 5.0 on Macintosh computers, and Wordperfect 5.1, Wordperfect 5.2 for Windows, and Microsoft Word 2.0 for Windows on IBM compatible computers. NCEO has only used Excel 4.0 spreadsheet software for Macintosh and IBM computers, but Lotus 123, Quattro and any other program that allows for easy entry, display, and calculation of a row of numbers will suffice.◆

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NCEO is supported through a Cooperative Agreement with the U.S. Department of Education, Office of Special Education Programs (H159C00004). Opinions or points of view do not necessarily represent those of the U.S. Department of Education or Offices within it.

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