Using Web Groupware and Cognitive Mapping in a CIS Department to Review and Revise the Assessment Process and Document Reasoning

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**Abstract**

During reaccreditation reviews, all 370 business schools that are currently accredited by the AACSB—The International Association for Management Education—must demonstrate that a continuous improvement process is in place. This paper describes the experience of the Computer Information Systems department at a public university in the U.S., which used collaborative software to update the assessment process for the Master's Program and to document the faculty's reasoning. Faculty were asked to examine assessment results, as well as to participate in asynchronous discussions using the Web groupware TCBWorks. Two groups of faculty met face to face and used the cognitive mapping software DecisionExplorer—one to generate assessment options and determine the consequences of using those options, and the other to revise program objectives for the next assessment cycle. Results of asynchronous discussions and the cognitive mapping sessions, as well as faculty members' evaluations of the process, are discussed.

**Introduction**

All 370 business schools that are currently accredited by the AACSB—The International Association for Management Education—must not only determine the level of student achievement in every degree program on a regular basis, but the assessment process must also be evaluated and updated every year [1]. As a result of new accreditation standards adopted in 1991, more faculty participation in the assessment process is expected [12].

This paper describes how the Computer Information Systems Department at a public university in the U.S. used collaborative technology to support continuous improvement efforts associated with the assessment of its Master’s program. Results obtained by the department’s assessment committee are compared to the results obtained as a result of the faculty’s use of collaborative technology.

The primary goal of the project described was to support the department’s assessment process. Data presented were collected to determine how the assessment process could be improved next year. A summary of previous research appears in the next section. Sections describing the CIS Department’s assessment process, research questions, the research methodology used, results, a discussion of results, and conclusions follow.

Results described may be helpful to other departments and institutions as they design their own assessment processes. This study also provides insights into how sophisticated computer users deal with collaborative technology.

**Previous research**

Mosvick and Nelson [9] determined that 50 percent of time spent in meetings is wasted because meetings are poorly planned and clear goals are not identified. Meetings associated with the AACSB assessment process are likely to involve a similar amount of wasted time, although no research has specifically examined assessment meetings. Assessment efforts involve formulating a strategy for reviewing and revising the assessment process, with the ultimate goal of improving a program’s curriculum. A long history of research on making strategy formulation more efficient through the use of collaborative technology exists. Dennis, Tyran, Vogel, and Nunamaker [6] and Eden and Ackermann [8] represent recent work from two well-known streams of research involving using collaborative software to support face-to-face meetings.

In contrast, software to support structured asynchronous discussions using nonproprietary systems (as opposed to e-mail and listservs, which offer unstructured discussion) has only recently become available. Still, fifteen organizations have used the Web groupware called TCBWorks for asynchronous discussion to supplement face-to-face meetings [5]. Such asynchronous, dispersed discussions allow participants to be more fully anonymous, so that sensitive issues can be discussed without fear of social disapproval [11]. The research described in this paper extends work done by Dennis, Pootheri, and Natarajan [5], in that a single organization’s use of TCBWorks is examined in detail.

Sweeney, Soutar, Hausknecht, Dullin, and Johnson [15] compared data collected from groups using a group
support system (GSS) versus focus groups engaged in creating items that could be used to describe and measure consumers’ cognitive dissonance. They found that GSS use improved the efficiency and effectiveness of groups meeting face to face in that a transcript of the GSS-supported meetings already existed at the end of the meeting, whereas transcription of tape recordings was required for focus groups. Also, GSS-supported groups produced a greater quantity of information. However, Sweeney et al. note that the facilitator of the GSS-supported groups felt that “the GSS groups lacked the free flowing discussions and ‘in-depth’ understanding obtained from some traditional group format with which he was familiar” [15, pp. 405-406]. Sweeney et al. also conclude that “the items generated within the GSS groups, while varied and covering the same conceptual areas as the traditional group items, were more conservative and less colourful,” which they attribute to the fact that writing “is a more serious commitment than speaking (traditional groups) and that recording ideas on paper creates inhibitions that do not exist when speaking” [15, p. 408]. According to the authors, GSS groups were subject to “greater repetition and potential boredom for some respondents” [15, p. 409]. Because they felt that “traditional focus groups tapped more vivid emotional feelings relating to dissonance than the GSS groups,” Sweeney et al. conclude: “It would seem that the usefulness of GSS approach [sic] depends on the purpose of the group sessions” [15, p. 409].

Cognitive mapping represents a hybrid between GSS sessions and traditional face-to-face meetings in that a record of group thoughts is captured during the session, but participants have a chance to talk. It has been used to understand what went wrong in the building of the Eurotunnel [2], as well as in less high-stakes problem solving, such as developing a U.K. take-home drink retailing strategy [16]. We concluded that evaluating and revising a curriculum are emotionally laden topics for faculty members. As a result, we decided not to use TCBWorks to support face-to-face meetings. Instead, we chose to use cognitive mapping in face-to-face meetings in which the facilitator served as a chauffeur because it would allow participants to talk, as opposed to having to enter typed input simultaneously. Models produced using cognitive mapping software would allow groups to have a written record of deliberations. While contributions would not be anonymous during modeling sessions, faculty would have another opportunity to participate anonymously in follow-up asynchronous discussions in TCBWorks.

Research on cognitive mapping and information technology is limited. Sheetz, Tegarden, Kozar, and Zigurs [14] and Sheetz, Irwin, Tegarden, Nelson, and Monarchi [13] used the GSS called VisionQuest to elicit difficulties that students had in learning and using object oriented techniques; results were combined into composite cognitive maps and used to develop guidelines for educators and trainers. While a GSS can be used to generate the concepts to be included in cognitive maps, participants discussing emotionally laden topics could be subject to inhibitions. To avoid the inhibitions of expressing emotionally laden issues in writing, we chose to allow faculty to talk and have a facilitator enter concepts and links into cognitive modeling software.

**Overview of the CIS Department’s assessment process**

During the 1998-99 academic year, the CIS Department’s 31 faculty members taught diverse courses including systems analysis and design, data modeling, programming, telecommunications, electronic commerce, business process reengineering, and managing information technology resources. In the last three years, 14 new faculty members were recruited.

Assessment of the MS/CIS program began in January, 1997. The assessment committee articulated seven objectives, which were implicit in the curriculum (See Table 1). The committee limited the number of objectives to seven to maintain a manageable process. Committee members were able to match six of these objectives with assignments in various core classes, but decided that it was impractical to assess student performance for objective B2. The faculty member who taught each core class identified assignments submitted that represented examples of best, average, and low-quality student work. Two faculty members (who did not teach the section from which the assignments were chosen) and two practitioners rated each assignment using a questionnaire developed by the committee. In addition, evaluators were asked to provide free-form feedback about the quality of student work.

The assessment committee summarized results of the faculty and practitioner reviews. Subsequently, the assessment committee reviewed the assessment results as well as the objectives and proposed modifications to two objectives. It concluded that the objectives were current and appropriate, but that assessment ratings were below expectations. It recommended that the reasons for the relatively low ratings be investigated and that ways of improving student performance be identified. Finally, the committee made three recommendations for updating the assessment process. The first such recommendation was intended to have each objective fulfilled by a specific core course (See Table 2). The second recommendation involved a minor change in the wording of objective B3, while the third represented a significant expansion of the scope of the communication objective A1. All reports of...
the committee were available to the faculty in hard copy form, and the recommendations were explained in a memorandum posted on the assessment website, in preparation for the faculty meeting on December 5, 1997.

Table 1. Objectives formulated for first assessment cycle.

<table>
<thead>
<tr>
<th>Motion</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1:</td>
<td>Students will be capable of presenting technical material to a non-technical audience.</td>
</tr>
<tr>
<td>A2:</td>
<td>Students will be able to identify opportunities associated with an emerging technology.</td>
</tr>
<tr>
<td>B1:</td>
<td>Students will be able to specify the requirements for an information system that meets user needs.</td>
</tr>
<tr>
<td>B2:</td>
<td>Students will be able to read a systems specification, analyze user data requirements, and then design an information system that meets the specification.</td>
</tr>
<tr>
<td>B3:</td>
<td>Students will be able to read a program specification and then design, code, test, and document a computer program that meets the specification.</td>
</tr>
<tr>
<td>C1:</td>
<td>Students will be able to translate a set of project requirements and resources into a workable plan.</td>
</tr>
<tr>
<td>C2:</td>
<td>Students will be able to establish a mechanism that can be used to select from among competing projects.</td>
</tr>
<tr>
<td>C3:</td>
<td>Students will be able to read a program specification, analyze user data requirements, and then design an information system that meets the specification.</td>
</tr>
</tbody>
</table>

The assessment recommendations were the last items on the meeting agenda. By the time other agenda items had been addressed, there were less than five minutes left. One motion was discussed, but there was no time left to vote on even the first motion, let alone the other two. At this point, the department head concluded that the department was too large and that matters requiring extensive discussion could no longer be addressed in a faculty meeting. As a result, the head of the assessment committee and a faculty member with experience in using groupware designed a multi-stage process for eliciting faculty input.

Research questions

The authors designed a process that they thought would fit the constraints of the department. They solicited feedback from one of the designers of Decision Explorer and secured the approval of the department head for the plan.

Table 2: Results of the assessment committee’s effort to improve the assessment process and document its reasoning.

<table>
<thead>
<tr>
<th>Motion</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion 1:</td>
<td>Each objective should be fulfilled by a specific core course, each core course should have an assignment to assess the objective, and the objective should be stated in the course syllabus.</td>
</tr>
</tbody>
</table>

Motion 2: The term code in Objective B3 should be changed to develop.

Motion 3: Objective A1 should be modified: Students should possess the ability to write memos, letters, and reports in a style appropriate to business, with contents that are clear, concise and objective oriented. They must be able to develop and deliver effective oral presentations, including appropriate, high-impact visuals in support of key idea[s]. All graduates should be capable of presenting technical material to a non-technical audience.

Questions to be answered at the end of this process were: (1) Do faculty members prefer structured, asynchronous discussions of assessment results via Web groupware over regular faculty meetings? (2) Do faculty members prefer using chauffeured cognitive mapping software over regular faculty meetings to revise the list of objectives and to determine which assessment methods should be used? (3) Do CIS Department faculty prefer Web-based dissemination of assessment results over hard-copy reports? (4) How will the assessment process and the results be affected by use of collaboration technologies, as opposed to traditional faculty meetings?

Research methodology

The department was recruiting five new faculty members, with the result that time available for face-to-face meetings about assessment was severely limited. For this reason, the last phase of the assessment process was designed to consist of four stages:

Stage 1: Nine structured asynchronous discussions focused around each of the seven objectives as well as two more general topics: how to improve the assessment process, and whether “each objective should be fulfilled by a specific core course, each core course should have an assignment to assess the objective, and the objective should be stated in the course syllabus.” Since the assessment committee had no budget for acquiring new software, TCBWorks was selected because it was available via the Web to all faculty members in their offices and at home, regardless of the client PC they used.

Stage 2: Two face-to-face sessions, one devoted to identifying assessment options and the other to revising the objectives of the Master’s program, were held. The authors originally proposed holding eight sessions in which a facilitator would record each group’s decisions about each objective and the overall assessment process using cognitive mapping software. However, the department head reduced the number of face-to-face meetings to two two-hour sessions. Half of the permanent faculty were asked to attend each session. The cognitive
mapping software called Decision Explorer had been acquired the previous year, and one of the authors had been trained by one of the designers of the software. Resulting models are displayed in Figures 1 and 2.

Stage 3: Two additional asynchronous discussions in TCBWorks were held to determine if the models produced with Decision Explorer were complete, clear, and correct.

Stage 4: A final vote by all faculty on all assessment alternatives and all proposed new objectives was conducted. The authors had originally proposed that the full faculty would meet to discuss and complete the models, but there was no time available for such face-to-face meetings. After the faculty had voted on all assessment options and objectives (on a scale of 1 = Extremely Unimportant, 5 = Extremely Important), faculty were asked to fill out a final questionnaire, to allow the assessment committee to make needed adjustments to the assessment process next year.

An action research focus guided this project. That is, the needs of the assessment process were given the highest priority. Data were collected as unobtrusively as possible and consisted of:

- Characterizing and counting the comments entered into the asynchronous discussions in Stages 1 and 3.
- Asking all participants in face-to-face cognitive mapping sessions to fill out a questionnaire asking about their use or failure to use TCBWorks. As a result, we also know how many faculty members participated in asynchronous discussions. Items from Davis [3], whose validity and reliability were established by Doll, Hendrickson, and Deng [7], as well as some open-ended questions were included.
- Examining the model of assessment options and the model of new program objectives, which were produced during the two face-to-face sessions supported by Decision Explorer.
- Having both facilitators for the cognitive mapping sessions record their impressions of the sessions.
- Asking all participants in each cognitive mapping session to fill out a questionnaire at the conclusion of each mapping session. This questionnaire included items from Davis [3] as well as open-ended questions.
- Having facilitators conduct informal discussions with some participants after each session.
- Asking faculty to fill out a final questionnaire about the use of collaborative technology in this assessment cycle and how next year’s assessment should be conducted.

Results

Stage 1: Analysis of comments entered into TCBWorks discussions produced one new assessment option: creating a capstone course in which attainment of program objectives will be evaluated. In addition, one person argued that teaching students to create high-impact visuals (which was recommended by the assessment committee as part of the proposed new communication objective) was not the function of a CIS program, two people suggested major changes to existing objectives to make them reflect object oriented analysis and design, and three suggested new objectives (work as teams, assimilate and interpret new technologies, and understand the role of data networking and infrastructure (Web)).

TCBWorks projects can consist of one or more topics, in which participants enter comments. Projects for Objectives A1, A2, B1, B3, C1, and C2 consisted of three topics: "Enhancement of students’ performance," "Modification of objective," and "Improvements in the assessment process.” In contrast, projects called “Correlating objectives and courses” and “Suggestions for improvement of the overall assessment process” contained only a single topic whose name was identical to the corresponding project name. The project for objective B2 only contained one topic (“Enhancement of students' performance”).

Sixty-seven comments were entered into all TCBWorks projects, with an average number of comments per topic of 3.94. Comments in the first TCBWorks discussions can be characterized as expressions of agreement with committee recommendations, suggested changes in wording, questioning assumptions implicit in the committee’s recommendations, as well as reservations about the feasibility and consequences of implementing the committee’s recommendations. One comment in the discussions of how students’ performance in presenting technical material could be enhanced expressed a sensitive issue: “The problem was that I was scared to mark them down too much because of the course evals. (Sorry, that I have to admit this.)” Comments in “Suggestions for improvement of the overall assessment process” included a complaint about TCBWorks’ user interface and a response from a facilitator explaining the assumptions under which the discussions were designed (each should be self contained, every faculty member might not participate in all discussions, and people should be able to participate in discussions in any order).

Participants appeared to participate in discussions that interested them, since the number of comments entered
dropped for objectives C1 and C2 but returned to higher levels for projects lower in the list. The drop-off in participation cannot simply be explained as people stopping when they ran out of time, wherever they were in the sequence of projects.

While the average number of comments for “Improvements in the assessment process” topics (average 3.4 comments in 6 projects; range: 1 to 7) is lowest, the range in the number of comments is the same as it is for “Enhancement of students’ performance” topics (average 4.14 comments in 7 projects; range: 1 to 7). The highest average number of comments was for “Modification of objective” topics (average 4.5 comments in 2 projects; range: 3 to 6). Faculty may have been slightly less able to contribute suggestions for improvements in the assessment process, for objectives that did not involve their specialties.

Twenty-nine faculty members (in addition to the two who served as facilitators) were given access to asynchronous discussions. Six usable questionnaires were received from respondents who said they participated in TCBWorks discussions and also rated TCBWorks. Ten respondents said they did not participate in TCBWorks discussions, for a response rate of 85 percent (17 out of 20 questionnaires returned). Because of the high response rate, no attempt was made to send out a follow-up questionnaire. There does not appear to be a non-response bias. Responses on questionnaires filled out at the beginning of cognitive mapping sessions show that 6 faculty members or 20.7 percent of the faculty entered comments into TCBWorks. (The authors served as facilitators and neither entered comments nor filled out questionnaires.) The number of comments entered per topic roughly corresponds to the six people who on Stage 1 questionnaires reported participating in TCBWorks discussions.

Descriptive statistics for TCBWorks usefulness and ease of use appear in Table 3. One could characterize people who participated in TCBWorks discussions as falling into one of two groups. Four respondents had average ratings for all twelve items that were slightly positive (5.09, 5.55, 5.55, and 5.82), while two respondents gave ratings whose average for all items was slightly negative (3.73 and 3.82). Respondents whose average ratings were lower liked the “possible tree structured presentation,” “the ability to view others’ comments,” “the ease of use,” and that it was “easy to correlate discussion on specific issues.” Aspects of TCBWorks that the latter disliked were: “needed more structure from the administrators to begin process,” “one more task to do,” it “took a little time to figure out how to use it,” and “I had an older computer at the time & it was painfully slow—frustrating!”

**Stage 2:** The first group of 10 faculty members met on March 26, 1999. The model in Figure 1 resulted from this session. Each text cluster is a concept, and each arrow is a link. For example, there is a link from concept number 45 (create project course) to concept number 41 (find large number of new projects). The link should be interpreted to mean “may lead to” [8]. Concept number 12 is in a larger font to indicate that it is the only goal in this model. Concept number 30 is also in a larger font, but it is in a red font, which indicates that this is a negative goal—an outcome to be avoided. Numbers in parentheses are the average ratings that meeting participants gave each assessment option. Some concepts (for example, 14 (identify and correct weaknesses in the curriculum) represent processes required by the AACSB, rather than assessment methods.

Of the 20 assessment options (those concepts whose text is followed by a mean rating in parentheses), 15 were formulated by faculty during the face-to-face session using Decision Explorer, 4 were contributed by the chair of the assessment committee after reviewing assessment methods that other departments in the college had used, and one option came from TCBWorks discussions. Concepts number 12, 13, 14, 15, 16, and 3 as well as links between them were entered into the Decision Explorer model before the session began, to graphically explain the AACSB requirements for assessment. Other concepts that are not assessment options (for example, “41 find large number of new projects” and “42 implement ongoing projects”) show consequences of implementing a specific option.

The model in Figure 2 was created by the second group of faculty members, who met face to face on April
Table 3. Descriptive statistics for TCBWorks and Decision Explorer usefulness and ease of use. Group 1 created the model of assessment options, while Group 2 created the model of objectives. (Rating scale: 1 = Extremely Unlikely, 7 = Extremely Likely)

<table>
<thead>
<tr>
<th>Question</th>
<th>TCBWorks Mean Rating (S.D.)</th>
<th>Modeling Group 1 Mean Rating (S.D.)</th>
<th>Modeling Group 2 Mean Rating (S.D.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using TCBWorks (Decision Explorer) in CIS Department group decision making would enable me to accomplish tasks more quickly.</td>
<td>4.83 (1.17)</td>
<td>3.67 (1.50)</td>
<td>5.88 (0.64)</td>
</tr>
<tr>
<td>Using TCBWorks (Decision Explorer) would improve my performance in CIS Department group decision making.</td>
<td>4.50 (0.84)</td>
<td>3.75 (1.42)</td>
<td>5.88 (0.64)</td>
</tr>
<tr>
<td>Using TCBWorks (Decision Explorer) would increase my productivity in (CIS Department group decision making).</td>
<td>3.83 (1.17)</td>
<td>3.42 (1.78)</td>
<td>5.88 (0.83)</td>
</tr>
<tr>
<td>Using TCBWorks (Decision Explorer) would enhance my effectiveness in CIS Department group decision making.</td>
<td>4.33 (1.37)</td>
<td>3.92 (1.73)</td>
<td>5.38 (0.92)</td>
</tr>
<tr>
<td>Using TCBWorks (Decision Explorer) would make it easier to do my job (in CIS Department group decision making).</td>
<td>3.83 (1.33)</td>
<td>3.92 (1.56)</td>
<td>5.00 (0.53)</td>
</tr>
<tr>
<td>I would find TCBWorks (Decision Explorer) useful in my job (in CIS Department group decision making).</td>
<td>4.00 (1.10)</td>
<td>3.83 (1.85)</td>
<td>5.63 (0.74)</td>
</tr>
<tr>
<td>Learning to operate TCBWorks (Decision Explorer) would be easy for me.</td>
<td>4.83 (0.98)</td>
<td>5.58 (1.31)</td>
<td>5.25 (1.75)</td>
</tr>
<tr>
<td>I would find it easy to get TCBWorks (Decision Explorer) to do what I want it to do.</td>
<td>4.50 (1.64)</td>
<td>4.25 (1.60)</td>
<td>5.00 (1.60)</td>
</tr>
<tr>
<td>My interaction with TCBWorks (Decision Explorer) would be clear and understandable.</td>
<td>4.67 (1.03)</td>
<td>4.25 (0.48)</td>
<td>5.13 (1.46)</td>
</tr>
<tr>
<td>I would find TCBWorks (Decision Explorer) to be flexible to interact with.</td>
<td>4.67 (1.37)</td>
<td>4.00 (1.28)</td>
<td>5.38 (1.51)</td>
</tr>
<tr>
<td>It would be easy for me to become skillful at using TCBWorks (Decision Explorer).</td>
<td>5.17 (1.17)</td>
<td>5.00 (1.21)</td>
<td>5.25 (1.58)</td>
</tr>
<tr>
<td>I would find TCBWorks (Decision Explorer) easy to use.</td>
<td>5.00 (1.10)</td>
<td>5.08 (1.00)</td>
<td>5.13 (1.55)</td>
</tr>
</tbody>
</table>

1, 1999. Concept 12 (get reaccredited) is again the goal. This model not only increased the number of objectives from the seven to which the committee limited itself, but connections between objectives are shown. Links between objectives show which objectives cannot be satisfied unless a student has satisfied another objective. For example, to be able to communicate effectively (concept 86), a student must be able to write memos, letters, and reports (concept 89) and give effective oral presentations (concept 90). Table 4 shows the sources of the 17 objectives (those concepts followed by mean ratings in parentheses) generated by the faculty.

There were 12 participants in the first Decision Explorer session and 8 in the second. At the end of each modeling session, participants filled out a questionnaire. Again, Likert-scale items from Davis [3] as well as open-ended questions were included. Twenty participants in the two Decision Explorer sessions returned questionnaires, for a response rate of 100 percent. Questions and mean ratings given by participants in both Decision Explorer sessions are shown in Table 3.

An overwhelming majority of CIS faculty considered the modeling process helpful (Yes: 13; No: 3), insightful (Yes: 11; No: 4), and a way that CIS faculty can reach consensus on controversial and/or complex issues (Yes: 10; No: 3). A majority also considered the resulting models valuable and/or useful (Yes: 13; No: 1) and agreed with the resulting models (Yes: 13; No: 2). Most felt that the modeling process was more useful than a general faculty meeting discussion (Yes: 12; No: 1).

Stage 3: When both groups had participated in modeling sessions using Decision Explorer, two new TCBWorks discussions were created and announced to the faculty. For each discussion, participants were asked to view the respective model generated in the face-to-face mapping session and respond to three questions: (1) Is anything missing from the model? (2) Does something need to be revised or re-worded? (3) Is there something unclear about the model? The facilitators chose to have only one topic for each project, to minimize the complexity of the discussion and to avoid duplication. Three comments were entered in the discussion of the assessment process model. These
involved expressions of support for having a capstone course, ideas for successful implementation, a request for clarification of two concepts, an explanation of the objectives that were confusing, as well as another expression of support, with reservations about the difficulty of implementing a capstone course. Only one comment was entered in the discussion of MS/CIS program objectives. The comment “Any ideas anyone?” was intended to spark discussion, but there were no responses.

**Table 4. Sources of objectives in final model.**

<table>
<thead>
<tr>
<th>Source(s)</th>
<th>Number of Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original objectives (unchanged)</td>
<td>2</td>
</tr>
<tr>
<td>Assessment committee only</td>
<td>2</td>
</tr>
<tr>
<td>TCBWorks discussions only</td>
<td>1</td>
</tr>
<tr>
<td>Original objectives modified during modeling session</td>
<td>5</td>
</tr>
<tr>
<td>Assessment committee, modified during modeling session</td>
<td>1</td>
</tr>
<tr>
<td>Assessment committee, modified during TCBWorks discussion and during modeling session</td>
<td>1</td>
</tr>
<tr>
<td>TCBWorks discussions, modified during modeling session</td>
<td>3</td>
</tr>
<tr>
<td>Modeling session only</td>
<td>2</td>
</tr>
</tbody>
</table>

**Stage 4:** Eleven faculty members out of a possible 29 (a response rate of 38 percent) returned a questionnaire asking for input about the entire assessment process. We attribute the low response rate to the fact that questionnaires were sent out during summer vacation. Seven people preferred that assessment information be disseminated by posting on the Web, while five preferred hard-copy documentation (some respondents checked both). Eight respondents found the visual representation in Decision Explorer models helpful, while two did not.

**Discussion**

Although average Likert-scale ratings for the usefulness and ease of use of TCBWorks reflected some reservations about the software, answers to open-ended questions were more positive. Four people listed a lack of time as an obstacle they faced in participating in TCBWorks discussions, and four people had inadequate client PCs. One person commented that the department’s use of Decision Explorer and TCBWorks “will become more effective with experience.” Because time for face-to-face meetings is limited, the department will probably use its recently developed intranet for less structured discussions about assessment. We expect that faculty members will incorporate participating in the assessment process as part of their routine in future years, just as use of the department’s intranet for recruiting has been accepted as part of the recruiting process in the second year of its existence, although few faculty members used it when it first became available.

Responses to Likert-scale items about the Decision Explorer sessions were lower for the first session than the second. A projector malfunctioned during the first session, and the model became too large to fit on a single screen, with the result that the facilitator’s scrolling through the model irritated some participants. In addition, the facilitators included the concept “minimize the assessment process” on the map presented to faculty at the beginning of the meeting, because the assessment committee felt that the first assessment process had required an inordinate amount of effort on the part of the committee. This one concept created discomfort in the group. The wording of the concept was changed to “minimize the work involved in the assessment process.” At the end of the meeting, one facilitator found a copy of the initial map distributed to the faculty, with the syllable “min” crossed out and replaced with “max.” Because of the position of the sheet, the person could be identified. As a result of a follow-up discussion with the faculty member, the entire concept was removed. Links to it all became links to “demonstrate student skills for the accreditation.”

The facilitators now felt that everything about the map was ready for public display except the wording of one concept: “56 embarrass us when they see low-end work,” which was shown as the consequence of “55 invite SIM teams/consultants for site visits.” The wording of 56 was changed to the more neutral “expose low-end work.” Discomfort with the wording of the two concepts discussed reflects the fact that the models are intended to become part of the public record.

In planning the second modeling session, the facilitators resisted the temptation to include the committee’s rule of thumb that the number of objectives should be limited to 7. No projection problems distracted participants from viewing the projected image of the Decision Explorer model. Verbal comments by participants coincided with the much more positive ratings given to Decision Explorer after the second session. However, a few participants commented that chauffeured use of Decision Explorer allowed some participants to dominate the session. This latter problem could be overcome next year by allowing simultaneous input of concepts and links in Group Explorer, the software that allows groups to work with Decision.
Explorer. An unanswered question is whether use of Group Explorer would, like use of a GSS, reduce free-flowing discussion and inhibit the expression of ideas that are not completely thought out.

Although every faculty member in the department is familiar with computer technology, many people preferred to receive documentation either in hard-copy form or both via the Web and in hard-copy form. Even experienced computer users resist using computers for one more task. For some, use of the computer is part of their daily work, and this is just more of the same medium—beyond the saturation point. They prefer to print out Web-based documents and read printouts, instead of gazing at the PC screen even longer that day.

For others, a printout is preferable because they can take a printout on public transportation and read it during time when they cannot access Web-based applications. One person commented: “Sometimes hard copy gets attention among the masses of electronic forms I get,” while another noted: “I usually print out a web doc. [sic] to read it.”

Comparison of the assessment committee’s recommendations with the results of participation by the entire faculty in TCBWorks discussions and modeling sessions using Decision Explorer shows that far more assessment options and their intended and unintended consequences were considered as a result of the use of collaborative technology.
Similarly, the number and wording of objectives is very different from what they would have been if the original recommendations of the assessment committee had been adopted. Our experiences suggest that use of the combination of asynchronous discussions and modeling included all faculty members in some way in dialogue about the assessment process. Even a faculty member who was unable to participate in either TCBWorks discussions or modeling sessions commented: “I liked the causal maps.”

Conclusion

Use of TCBWorks for structured asynchronous discussions and the use of Decision Explorer for generation of final models of assessment options and assessment objectives allowed the CIS Department to consider a much larger number of options than those that had been identified by the assessment committee. The department’s experience has led us to formulate the following recommendations for others considering using the same or similar collaborative technology for discussing assessment or an equally emotional issue:

- Many faculty members are too busy to log onto anonymous asynchronous discussions. However, over time, as the assessment process becomes institutionalized, participation in asynchronous discussions may increase.
- Assessment results and inputs to asynchronous discussions should be available both online and as printouts. Faculty who become involved in what they read may be more likely to log on and contribute their inputs to online discussions.
- For modeling sessions using cognitive mapping software, models presented at the beginning of a session should only contain the aspects of the problem that are not negotiable (for example, the requirements of the AACSB) and nothing reflecting preferences of the assessment committee. This will avoid distracting and irritating the group.
A high-resolution PC and projector would be helpful for the modeling sessions, to minimize scrolling back and forth to display parts of the model that do not all fit on the screen at once. If a model becomes large, the group should regularly receive updated printouts of the model, so group members can keep their bearings as scrolling takes place. Alternatively, the main model could be kept skeletal and elaboration of various parts of the model could occur in separate views.

References


