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Empirical Comparison of the Effectiveness of
Face-to-Face, Teleconferenced and Web-Facilitated Meetings
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Abstract

The purpose of this exploratory study was to compare the effectiveness of four collaborative meeting venues: (1) face-to-face collaborative systems, (2) web-based collaborative systems; (3) teleconferenced collaborative systems and (4) face-to-face systems. The following research questions were addressed:

1. What are the perceptions of session participants and facilitators toward each of the six GSS effectiveness constructs and their underlying factors defined by McAlister-Kizzier, et.al? Does a significant difference in perceived session effectiveness exist among the four meeting venues for the factors derived from the McAlister-Kizzier model?
2. What quantity of ideas was generated for each of the four meeting venues? Does a significant difference in the quantity of ideas exist among the four meeting venues?
3. What are the perceptions of session observers toward each of the following factors in the four meeting modes: (1) quality of ideas and recommendations generated; (2) level of confusion; (3) effect of facilitator personality on session effectiveness and on final recommendations; (4) effect of session organization and technological tools on the quality of final recommendations; (5) effect of facilitator's comfort with technology on the session quality; and (6) degree of success at geographically dispersed sites? Does a significant difference exist among the four meeting modes for any of these factors?

The effectiveness of the four collaborative venues was empirically compared based upon quantitative measurement of factors identified by McAlister-Kizzier, et. al. (2002) after a review of over 150 research studies. Theoretical underpinning for the study was based on the McAlister-Kizzier et. al., constructs (2002) and the Briggs Groupware Grid (Briggs, 1994).

Empirical analysis revealed significant statistical differences among the facilitation modes for 15 of the 34 factors studied. Conclusions and recommendations are provided.

Empirical Comparison of the Effectiveness of Face-to-Face, Teleconferenced and Web-Facilitated Meetings

Purpose of Study

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1. What are the perceptions of session participants and facilitators toward each of the six GSS effectiveness constructs and their underlying factors defined by McAlister-Kizzier, et. al. in 2002. Does a significant difference in perceived session effectiveness exist among the four meeting venues for the factors found in the McAlister-Kizzier et. al. model.
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Review of Literature

Collaborative Systems are “interactive computer-based environments which support concerted and coordinated team effort toward completion of joint tasks” (Nunamaker, et. al, 1997, p. 2). Multiple studies over the last decade have reported the collaborative systems can improve the effectiveness of meetings, support information access, and radically change group dynamics by improving communication (Nunamaker et. al., in Coleman, 1995: Nunamaker et. al 1997). Some advantages of collaborative technologies reported in the literature include increased participation, automatic recording of comments and votes, imposition of more structure, and the ability to accomplish more in less time than traditional, non-automated meetings. The ultimate result of these advantages include high group satisfaction with the meeting process and enabling larger

groups to meet, thereby enhancing the knowledge brought to bear on decisions (Aiken & Govindarajulu, 1995). Burdett (2000) concluded the potential of collaborative technologies to overcome barriers to women's equal participation in mixed gender meetings, thereby increasing satisfaction of women as well as the effectiveness of the meeting process.

McAlister-Kizzier et. al. (2003, p. 4) extracted six constructs from the GSS research. The authors relied heavily upon, but not exclusively, the results from over 150 research studies conducted during the last 13 years at the University of Arizona (Nunamaker et. al, in Coleman, 1995; Nunamaker et. al, 1997). Readers are directed to the McAlister-Kizzier et al manuscript posted in the 2002 OSRA Proceedings (pages 4-6) for a more detailed description of the model and its theoretical grounding. A summary of the constructs and factors follows:

Construct 1: Problem solving/decision making

- Structure and focus problem solving efforts
- Produce unique ideas of higher quality
- Increase the amount of ideas generated during divergent process

Construct 2: Group processes

- Establish and maintain alignment between personal and group goals
- Help role clarification
- Minimize gender inequities
- Achieve equal participation due to anonymity and parallel input
- Increase energy and group focus due to active participation
- Encourage more objective idea evaluation due to anonymity as continuous rather than discrete variable

Construct 3: Leadership/Commitment

- Increase the likelihood of "buy in" to the final results
- Make a poorly planned meeting worse if leadership is ineffective
- Be effectively used with diverse leadership styles, situations and organizational cultures
- Help resolve counterproductive conflicts between leadership styles

Construct 4: Bottom line issues

- Reduce labor costs by 50% and project time by up to 90%
- Improve the quality of ideas through anonymous constructive criticism
- Lead to improved quality of results
- Lead to higher participant satisfaction

Construct 5: Situational issues

- Successfully support multi-language meetings
- Display different levels of satisfaction implementation in multicultural settings
- Display behavioral differences across cultures in convergent activities with high power distance cultures being more resistant
- Be used effectively in the classroom
- Be used effectively in Business Process ReEngineering projects

Construct 6: Organizational issues

To enhance the success of GSS----

- Individuals must have incentives to contribute to the group effort
- Organizational incentives should be aligned with GSS
- Maintain GSS competence in the organization
- Consider successful use of GSS at geographically dispersed sites (still being studied)

The current study directly addresses a response to the final organizational issue identified in the McAlister-Kizzier et. al. model.

Methodology, Results and Discussion

Research Methods

Seven meetings were conducted for the purpose of this study. Each meeting followed the same agenda format and time limits. The meeting structure was a modified 30-minute SWOT (strength, weakness, opportunity, threat) analysis addressing participants' current work environment. Due to time constraints, threats were not addressed. Three minutes were allowed for introduction of meeting goals and ensuring everyone was engaged successfully in the meeting. Then, three minutes were allowed to generate strengths with a two minute overview of strengths. The same time five-minute time format was followed for the weakness and opportunity agenda items. Ten minutes were then allowed for ranking opportunities and reporting results/recommendations. Two minutes were allowed for session closure.

Seven 30-minute meetings were conducted in November and December, 2003. Fourteen to 22 subjects participated in each meeting, in addition to the facilitators and technical support staff. Details regarding these meetings are addressed next.

Two face-to-face meetings (without facilitate.com) were conducted, incorporating an oral facilitation format. In the face-to-face mode, facilitators used Smartboard, visual display units, Powerpoint and Excel to enable facilitation.

Two face-to-face meetings using facilitate.com were also conducted. In this meeting venue, facilitators introduced the various topics orally and were available to help participants with technical difficulty. Each participant used a laptop on the table in front of them, equipped with facilitate.com. Ideas were anonymously generated via keyboard by participants and then reviewed by all during agenda item transition. An additional session was set up using facilitate.com with all participants located in the U-shaped room equipped with the laptops and facilitate.com. In this treatment (called teleconferenced facilitation with facilitate.com), the facilitators were located at a remote site and used a speaker phone to facilitate the meeting. Technical assistants were available to assist participants.

Finally, two sessions were conducted using facilitate.com exclusively via the web. Both participants and facilitators were located at remote locations. The meeting used only the

communication capability of facilitate.com, which was similar to a one-way pop-up chat function. In this treatment, email was used before the web sessions to share essential information such as the time of the meeting, passwords, log-on instructions, etc.

The study design was controlled for consistency in the following factors: agenda, agenda item time, collaborative tools, meeting structure, location, meeting room set up and participant membership. Meeting facilitators were trained in a consistent format to control for facilitation format as much as feasible in a behavioral setting. To minimize personality bias, different facilitators were used for each meeting. Facilitators possessed different levels of facilitation expertise, with most inexperienced in facilitation skills before the study. To encourage open communication in the face-to-face, the meeting room was organized in a U-shaped design. Study participants knew each other before the study and had established a positive and open rapport. Facilitators were encouraged to insert their personalities and personal style into the sessions.

The facilitate.com technology failed two times during the study. During a face-to-face facilitate.com meeting, a participant accidentally disconnected the plug for the wireless tower. During a web-based facilitation session, the server (located half way across the continent) went down shortly after the meeting was started. Problems were fixed quickly and became a part of the “reality” experience of the study.

Data were collected using survey research design tools designed and face validated by faculty and graduate assistants grounded in collaborative technology research. The study tools were designed based on relevant factors in the the McAlister-Kizzier, et. al. (2002) constructs as well as additional effectiveness factors defined in the GSS literature. Study participants included 107 session participants, 20 facilitators and 35 observers. To minimize recall errors, results were collected immediately after the facilitation sessions.

Discussion of Results

The discussion which follows addresses Research Question 1: What are the perceptions of session participants and facilitators toward each of the six GSS effectiveness constructs and their underlying factors defined by McAlister-Kizzier, et. al. (McAlister-Kizzier, et. al, 2002)? And, does a significant difference in perceived session effectiveness exist among the four meeting venues for the factors found in each of the five constructs defined within the McAlister-Kizzier model: (1) problem solving decision making construct; (2) group process construct; (3) leadership/commitment construct; (4) bottom-line construct; and (5) organizational construct?

Table 1 displays mean and standard deviation scores for the four comparison groups on each of the factors in the “problem solving/decision making” construct. Since the descriptive statistics suggested significant difference by facilitation mode, Pearson Correlations were computed for each of the factors in the problem solving/decision making construct and are also displayed in Table 1.

The results indicated that web-based facilitation was not perceived as effective as the other facilitation modes for structuring and focusing problem solving; a significant difference among modes at the .01 level was found for this factor.

Table 1
 Problem Solving/Decision Making Construct
 N = 127 (Participant=107; Facilitator=20)
 5 = strong and 1 = weak agreement

Problem Solving/Decision Making Construct	Face to face without facilitate.com	Face to face with facilitate.com	Web-based facilitation with facilitate.com	Teleconferenced Facilitation with facilitate.com	Pearson Correlation (2-tailed) w/FacMode
	N = 44	N = 38	N = 31	N = 14	N = 127
Factors	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	**sig at .01 * sig at .05
Focused problem solving?	4.41(.62)	4.32 (.66)	3.42 (.96)	4.14 (.53)	-.322** .000
Produced unique high quality ideas?	4.02 (.85)	4.58 (.60)	3.87 (1.15)	4.00 (.88)	-.064 .477

Table 2 displays mean and standard deviation results by each of the four comparison groups on each of the factors in the “group process” construct. Since the descriptive statistics suggested significant difference by facilitation mode, Pearson Correlations were computed for each of the group processes factors and are reported in Table 2. Four factors in this construct were found to differ significantly by facilitation venue. Web-based facilitation was perceived as significantly less effective in keeping the session on task (.01). Additionally, face-to-face facilitation without facilitate.com was perceived as the least likely to minimize gender inequity (.05). Face-to-face modes were less likely to achieve equal participation due to anonymity and parallel input (.05) and, similarly, face-to-face facilitation was perceived least likely to encourage more objective idea evaluation due to anonymity (.01).

Table 2
 Group Processes Construct
 Total N = 127 (Participant=107; Facilitator=20)
 5 = strong and 1 = weak agreement

Group Process Construct	Face to face without facilitate.com	Face to face with facilitate.com	Web-based facilitation with facilitate.com	Teleconferenced Facilitation with facilitate.com	Pearson Correlation (2-tailed) w/FacMode
	N = 44	N = 38	N = 31	N = 14	N = 127
Factors	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	**sig at .01 * sig at .05
Kept session on task?	4.43 (.63)	4.58 (.55)	3.26 (1.06)	4.00 (.88)	-.374** .000

Minimized gender inequities?	3.85 (1.20)	4.70 (.52)	4.50 (.84)	4.29 (.73)	.202* .027
Achieved equal participation (anonymity & parallel input)?	3.46 (1.19)	4.68 (.53)	4.29 (.94)	4.07 (1.0)	.231* .010
Increased energy & group focus due to active participation?	4.07 (.90)	3.97 (.72)	3.13 (1.20)	4.29 (.73)	-.153 .085
Encouraged more objective idea evaluation due to anonymity?	3.31 (1.21)	4.61 (.55)	4.10 (1.08)	4.36 (.93)	-.284** .002

Table 3 displays results by each of the four comparison groups on the factors composing the “leadership/commitment” construct. Since the descriptive statistics suggested significant difference by facilitation mode, Pearson Correlations were computed for the leadership/commitment factors and are reported in Table 3. Three of the leadership/commitment factors were found to differ significantly among facilitation modes. The perception of increased likelihood of “buy in” to the final recommendations was perceived weaker for web-based facilitation (.01). Face to face facilitation without facilitate.com was also perceived as having a significantly weaker potential (.01) to make a poorly planned meeting worse due to ineffective leadership/facilitation skills; likewise, face-to-face facilitation was perceived as having potential (.01) to make a well planned meeting better due to effective leadership/facilitation skills.

Table 3
Leadership/Commitment Construct
Total N = 127 (Participant=107; Facilitator=20)
5 = strong and 1 = weak agreement

Leadership Commitment Construct	Face to face without facilitate.com N = 44	Face to face with facilitate.com N = 38	Web-based facilitation with facilitate.com N = 31	Teleconferenced Facilitation with facilitate.com N = 14	Pearson Correlation (two-tailed) w/FacMode N = 127
Factors	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	**sig at .01 * sig at .05

Increased likelihood of “buy in” to the final recommendations?	3.98 (.68)	3.63 (1.05)	3.00 (1.17)	3.50 (.76)	-.290** .001
Made a poorly planned meeting worse due to ineffective leadership/facilitation skills?	1.93 (1.05)	2.09 (1.16)	3.14 (1.38)	2.17 (1.19)	-.246** .008
Made a well planned meeting better due to effective leadership/.facilitation skills?	4.37 (.62)	4.24 (.79)	3.24 (1.21)	4.23 (.73)	-.278** .002
Could be effectively used with diverse leadership styles?	4.11 (.69)	4.13 (.74)	3.60 (1.22)	4.21 (.70)	-.100 .267
Could be effectively used with diverse situations?	4.02 (.66)	4.16 (1.03)	3.68 (1.08)	4.21 (.80)	-.043 .633
Could be effectively used with diverse organizational cultures?	3.89 (.78)	4.11 (.83)	3.74 (1.06)	4.21 (.70)	.033 .710
Could help resolve counterproductive conflicts between leadership styles?	3.74 (.82)	4.21 (.78)	3.48 (1.15)	4.14 (.86)	.015 .865

Table 4 displays results by each of the four comparison groups on the “bottom line” and “organizational” constructs. Since the descriptive statistics suggested significant difference by facilitation mode, Pearson Correlations were computed for the bottom line and organizational factors; these results are also reported in Table 4. Significant differences at the .01 level were found for three factors. Respondents perceived that face-to-face facilitation would be less likely to (1) reduce labor costs related to meeting facilitation (2) improve the quality of ideas through anonymous constructive criticism; and (3) be used effectively at geographically dispersed sites.

Table 4
Bottom Line and Organizational Factors
Total N = 127 (Participant = 107; Facilitator = 20)
5 = strong and 1 = weak agreement

Bottom Line and Organizational	Face to face without facilitate.com	Face to face with facilitate.com	Web-based facilitation with	Teleconferenced Facilitation with	Pearson Correlation (2-tailed)
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Constructs	N = 44	N = 38	facilitate.com N = 31	facilitate.com N = 14	w/FacMode N = 127
Factors	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	**sig at .01 * sig at .05
Could reduce labor costs through such factors as productivity increases, travel time savings, etc.?	3.12 (1.27)	4.13 (1.07)	4.00 (1.15)	4.36 (.74)	.329** .000
Improve the quality of ideas through anonymous constructive criticism?	3.11 (1.39)	4.39 (1.03)	4.26 (.89)	4.21 (.70)	.325** .000
Contributed to improved quality of meeting results?	3.82 (.87)	4.47 (.56)	3.27 (1.14)	4.07 (.47)	-.091 .313
Lead to higher participant satisfaction?	3.95 (.68)	4.58 (.60)	3.65 (1.23)	4.29 (.73)	-.022 .805
Could be used successfully at geographically dispersed sites?	2.67 (1.19)	4.13 (.96)	3.94 (1.15)	4.43 (.76)	.455** .000

Research question two asked: What quantity of ideas was generated for each of the four meeting venues and does a significant difference in the quantity of ideas exist among the four meeting venues? Table 5 summarizes the total ideas recorded for selected agenda items by each facilitation venue. Pearson correlations were computed for each factor to determine if a significant difference existed by facilitation mode and are also reported in Table 5. Significance at .05 was found for total weakness and opportunity ideas generated, with face to face facilitation generating far fewer ideas in these categories.

Table 5
Ideas Generated by Facilitation Venue
Observer N = 35

Factors	Face to face without	Face to face with	Web-based facilitation	Teleconferenced Facilitation	Pearson Correlation
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	facilitate.com N = 9	facilitate.com N = 7	with facilitate.com N = 14	with facilitate.com N = 5	(2-tailed) w/FacMode N = 35
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	**sig at .01 * sig at .05
Total strength ideas	8.33 (.50)	26.86 (2.67)	20.57 (6.68)	11.00 (2.83)	.215 .215
Total weakness ideas	10.67 (.50)	29.57 (.53)	19.86 (1.83)	27.00(8.94)	.533** .001
Total opportunity ideas	8.67 (.50)	25.29 (2.14)	18.07 (.47)	17.00(6.00)	.438** .010

Finally, research question 3 asks, What are the perceptions of session observers toward each of the following factors in the four meeting modes: (1) quality of ideas and recommendations generated; (2) level of confusion; (3) effect of facilitator personality on session effectiveness and on final recommendations; (4) effect of session organization and technological tools on the quality of final recommendations; (5) effect of facilitator's comfort with technology on the session quality; and (6) degree of success at geographically dispersed sites? Does a significant difference exist among the four meeting modes for any of these factors?

Table 6 summarizes observers' perceptions to selected effectiveness factors for each facilitation venue. Pearson correlations were computed for each factor to determine if a significant difference existed by facilitation mode and are reported in Table 6. Significance at .01 was reported for perceived level of participation, with confusion the highest for web-based facilitation and the lowest for face-to-face facilitation without the use of the GSS technology. At the .05 level, significance was found for the effect of session organization on quality of final recommendations, with the weakest effect found for web-based GSS facilitation and the strongest effect found for face to face without the use of GSS tools.

Table 6
Focused Observation of Effectiveness of Facilitation Venues
Observer N = 35
1 = Low; Weak
5 = High; Strong

Factors	Face to face without facilitate.com	Face to face with facilitate.com	Web-based facilitation with facilitate.com	Teleconferenced Facilitation with facilitate.com	Pearson Correlation (2-tailed) w/FacMode N = 35
	N = 9	N = 7	N = 14	N = 5	**sig at .01 * sig at .05
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	

Quality of strength ideas	4.67 (.50)	4.43 (.53)	4.36 (.74)	3.80 (1.10)	-.332 .051
Quality of weakness ideas	4.89 (.33)	4.71 (.49)	4.36 (.63)	4.60(.55)	-.308 .072
Quality of opportunity ideas	4.56 (.53)	4.71 (.49)	4.00 (.78)	4.20 (.45)	-.324 .058
Qualify of final recommendations	4.11 (.78)	4.57 (.53)	4.14 (.53)	4.40 (.55)	.053 .762
Level of confusion	1.44 (1.01)	2.43 (1.51)	4.50 (.52)	2.00 (.71)	.456** .006
Effect of facilitator personality on session effectiveness	4.56 (.73)	4.57 (.79)	1.82 (1.33)	4.60 (.55)	-.344 .054
Effect of personality on quality of final recommendations	4.11 (1.05)	2.71 (1.50)	2.45 (1.81)	4.25 (.96)	-.164 .378
Effect of session organization on quality of final recommendations	4.67 (.50)	4.43 (.79)	3.21 (1.05)	4.40 (.89)	-.349* .040
Effect of tech tools on quality of final recommendations	3.89 (1.45)	4.43 (.79)	3.50 (1.24)	4.00 (1.00)	-.085 .639
Effect of facilitator's comfort with technology on session quality	4.56 (.73)	3.86 (.90)	3.21 (1.19)	4.20 (.84)	-.295 .085
Degree of success at geographically dispersed sites	3.11 (1.27)	4.29 (.76)	3.71 (1.14)	4.60 (.55)	.326 .056

Conclusions and Recommendations

The results of this study suggest that a significant difference exists in effectiveness among the various facilitation venues. Meeting facilitators should bear in mind the effect on meeting effectiveness when selecting the appropriate meeting venue to achieve their goals. Empirical tests of significance reported significant differences in primarily the web-based and face-to-face facilitation modes. A summary of results by these two venues follows.

Web-based facilitation was not perceived as effective as the other facilitation modes for structuring and focusing problem solving. Similarly, web-based facilitation was perceived as less effective in keeping the session on task. Also, web-based facilitation was not perceived as effective as the other modes to increase the likelihood of “buy in” to final recommendations. The highest levels of confusion (a strong correlation) existed for web-based facilitation. Finally, participants reported the web-based facilitation venue had the weakest effect of session organization on the quality of recommendations; in other words, sessions organized via web-based facilitation modes had the potential for the lowest quality meeting recommendations of all venues.

In sum, in comparison to the other facilitation venues, participants found the web-based facilitation meetings the most confusing, more challenging to keep the session structured and on-task and less likely to achieve quality recommendations the participants could buy into. It is notable that research in face-to-face collaborative system reported imposition of more structure as an advantage of collaborative technology; the current suggests further investigation of this factor. It is useful when interpreting these results to consider the web server went down for several minutes during one of the web sessions and could have enhanced the perception of confusion.

Face-to-face facilitation without facilitate.com was perceived as having a weaker potential to make a poorly planned meeting worse due to ineffective leadership/facilitation skills; likewise, face-to-face facilitation was perceived as having potential to make a well planned meeting better due to effective leadership/facilitation skills. Face-to-face facilitation without facilitate.com was perceived as the least likely to minimize gender inequity and to achieve equal participation due to anonymity and parallel input. Similarly, face-to-face facilitation was perceived least likely to encourage more objective idea evaluation due to anonymity. Face to face was less likely to reduce labor costs related to meeting facilitation, improve the quality of ideas through anonymous constructive criticism and least likely to be used effectively at geographically dispersed sites. In addition, face-to-face meetings generated significantly fewer ideas in the same time format; in fact, this factor had the highest correlation of any factor studied. The lowest level of confusion existed for face-to-face meetings; level of confusion was highly correlated with meeting venue. Face-to-face with facilitate.com reported the strongest effect of session organization on the quality of recommendations.

In sum, the effectiveness of face-to-face meetings was perceived as being highly dependent on the facilitation and organizational skills of the facilitator. The face-to-face meetings were the least confusing for the participants and, although generating significantly fewer ideas, were perceived as having the potential to generate quality recommendations if well organized. In addition, the potential for inequitable participation was noted as a weakness, with such problems as potential gender inequity, anonymity, objectivity compromised. The potential for conducting meetings at geographically dispersed sites and economic factors were also noted as weaknesses. These results agree with the results of previous studies reported in the literature.

It is notable that no significant strengths or weaknesses were reported for the teleconferenced or face-to-face meetings using facilitate.com. These results might suggest these two collaborative facilitation venues as the most effective overall. These conclusions are in line with the current collaborative technologies research; however, the effectiveness of web-based collaborative meetings is just beginning to be explored.

This exploratory study suggests several avenues for future research:

1. To enhance reliability and validity of the current study, additional study participants should be added for all facilitation venues.
2. Additional facilitation venues should be compared, for example, (1) teleconferencing with two-way video capability (one-to-many and one-to-one); and (2) asynchronous web-based facilitation formats.
3. The use of other collaborative systems such as NetMeeting and WebX should be incorporated into similar studies to investigate the effect of the technological limitations.
4. The confusion factor, especially in web-based facilitation venues, needs additional investigation.
5. As technological capability expands, processes to effectively facilitate web-based meetings remain to be designed and suggest the need for creative problem solving and empirical investigation of new strategies.
6. Qualitative information was collected concurrently with this study and needs to be analyzed and reported; in sum, to more fully understand the organizational dynamics of meeting facilitation, more qualitative inquiry should be conducted in this research stream.

References

Briggs, R. O. The team theory of group productivity and its application to the development and testing of electronic group support technology. Unpublished Doctoral Dissertation, MIS Department, University of Arizona, Tucson, 1994.

Burdett, Jane. Changing channels. Using the electronic meeting system to increase equity in decision making. (Fall, 2000). Information Technology, Learning and Performance Journal, 18(2).

Coleman D. & Channa R., ed. (1995) Groupware: technologies and applications. Chapter 6: electronic meeting systems: ten years of lessons learned, by Nunamaker J., Briggs, R. and Mittleman, D. Prentice Hall Publishing, Upper Saddle River, NJ, 149-193.

Dennis, A. R., George, J. R.; Jessup, L. M.: Nunamaker, J. F. & Vogel, D. R. (1988) Information technology to support electronic meetings, MIS Quarterly, 12(4), 591-624.

DeSanctis, G. & Gallupe, R. B. (1987), A foundation for the study of group decision support systems, Management Science, 33(5), 589-609.

DeSanctis, G., & Poole, M. S. (1993), Capturing the complexity in advanced technology use: adaptive structuration theory. Organizational Science.

Fulk, J., Schmitz, J. & Steinfield, C. (1990). A social influence model of technology use. In J. Fulk & C. Steinfield (Eds.). Organizations and communication technology. Sage: Newbury Park, CA 117-140.

Kraemer, D. L. & King, J. L. (1988). Computer-based systems for cooperative work and group decision making. *ACM Computing Surveys*. 20(2), 115-146.

McAlister-Kizzier, D. L., C. S. Hunt, & E. A. Regan (2002), Using Collaborative Technologies for Graduate Information Systems Program Planning. Proceedings of the 21st Annual Organizational Systems Research Association Conference, Feb 22, 2002, available online at www.orsra.org (pages 1-13).

Nunamaker, J. F., Jr., R. O. Briggs, D. D. Mittleman, D. R. Vogel (1997), Lessons from a dozen years of group support systems research: a discussion of lab and field findings. <http://mies.cs.depaul.edu/research/JMIS.html>.

Poole, M. S. & DeSanctis, G. (1990). Understanding the use of group decision support systems: the theory of adaptive structuration. In J. Fulk & C. Steinfield (Eds.). Organizations and communication technology. Sage: Newbury Park, CA Sage. 173-193.

Short, J. E., Williams, E., & Christie, B. (1976). The social psychology of communications. London: Wiley.