

Effectiveness of Six Electronic Meeting Systems Perspectives from Qualitative Methods of Inquiry

Donna L. McAlister Kizzier
Department of Information Systems
College of Business
Morehead State University
Morehead, KY 40351
d.kizzier@moreheadstate.edu

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Abstract

The purpose of this study was to study the effectiveness of six electronic meeting systems (EMS). Results of qualitative methods of inquiry are reported. The larger study used mixed methods (quantitative and qualitative methods of inquiry) to compare 26 validated effectiveness factors clustered under 6 constructs for 6 meeting venues: face to face without Electronic Meeting Systems (EMS); face to face with EMS; teleconferenced with EMS; webcam with EMS; asynchronous web with EMS and synchronous web with EMS. The theoretical underpinning for the study is based on McAlister-Kizzier et. al. constructs (2002) and Briggs Groupware Grid (1994). For the larger study, published elsewhere, validated online survey instruments and qualitative methods were administered in a senior-level Business course as part of a learning activity. Conclusions and recommendations inform future research.

Theoretical Grounding

Several studies reported EMS 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). Advantages of EMS include imposition of more structure, increased participation, automatic recording of comments and votes, and the ability to accomplish more in less time than traditional meetings. The ultimate result improves group satisfaction and enables larger groups to meet, thereby enhancing the knowledge informing decisions (Aiken & Govindarajulu, 1995). Burdett (2000) concluded EMS has the potential to overcome barriers to women's equal participation in mixed gender meetings, thereby increasing satisfaction and effectiveness for women.

Previous research by McAlister-Kizzier, et. al. (2002) extracted six constructs from EMS research. In constructing the table, the author relied heavily, but not exclusively, upon the results from over 150 research studies conducted over the past 12 years at the University of Arizona. (Nunamaker et. al., in Coleman, 1995; Nunamaker et. al, 1997). The Kizzier constructs are illustrated in Figure 1.

Figure 1

Lessons Learned from GSS Research

GSS can--

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 Re-Engineering projects

To enhance the success of GSS--

Construct 6: Organizational Issues

- 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 geographical dispersed sites is still being studied

The model used to guide this study is grounded in social presence theory (Short, Williams & Christie, 1976), social information processing theory (Fulk, Schmitz & Steinfield, 1990), and adaptive structuration theory (DeSanctis & Poole, 1993; Poole & DeSanctis, 1990). Based on these theories, the process recognizes the following variables can effect group decisions: group tasks, presence of a strong leader, group norms, and bad inter-member relationships.

To further ground this study, the researcher used a theory-based heuristic model, called the Groupware Grid, useful for assessing the contribution of groupware technology to team productivity (Nunamaker et. al., 1997). Figure 2 displays the Groupware Grid.

The horizontal axis of the Groupware Grid notes three cognitive processes (communication, deliberation and information access) that, according to the Team Theory of Group Productivity (Briggs, 1994) interfere with each other during group processes, thereby limiting group productivity. Within the communication construct, people attend to choosing words, images, artifacts and behaviors to convey through a medium to team members. Within deliberation, team members use problem-solving activities to form intentions to achieve goals. Within the information access construct, members focus upon finding, storing, processing and retrieving information needed to support deliberations. According to the Team Theory of Group Productivity, the key function of information is to increase the chances of expected outcomes by choosing one course of action over another.

Furthermore, Team Theory posits the cognitive effort needed to achieve communication, deliberation and information access is motivated by the degree to which interests of individuals are in congruence with the group goal. Given this assumption, the horizontal axis of the Groupware Grid attends to the potential for

the technology to affect the cognitive costs of joint effort. In sum, according to the Groupware Grid, EMS/groupware may become less productive if the attention demands for communication, deliberation or information access become too high. Conversely, groupware may improve productivity if it reduces the attention costs of these three processes.

The horizontal axis of the Groupware Grid describes three levels of group work. Level one is the individual work level, which means individual efforts that require no coordination. Level two is the coordinated work level, in which the work requires careful coordination between otherwise independent individual efforts. Finally, the concerted, or group dynamics, work level requires continuous concerted effort. EMS technology is currently available to support all three levels.

Figure 2
The Groupware Grid

	Communication Support	Deliberation Support	Information Access Support
Concerted/Group Dynamics Level	Anonymity Parallel Contribution	Structured & Focused Processes	Session Transcripts Automatic Concept Classification
Coordinated Level	Asynchronous Communication	Schedule matching Automated workflow Project Management	Shared Data Stores
Individual Level	Preparing Communication Stimuli	Modeling Simulation	Information Filtering Local Data Stores

Nunamaker et. al. (1995) identified why teamwork can be challenging. Poor teamwork can be influenced by such factors as waiting to speak, domination, fear of speaking, misunderstanding, inattention, lack of focus, inadequate criteria, premature decisions, missing information, distractions, digressions, wrong people, groupthink, poor grasp of problem, ignored alternatives, poor planning, lack of consensus, hidden agendas, inadequate resources, conflict, and poorly defined goals. A properly designed facilitation session strives to eliminate or minimize these factors.

Research Questions

The quantitative arm of the larger EMS research project addressed the following research questions: What are the perceptions of meeting participants and facilitators toward each construct/factor? Does a significant difference exist in perception toward each factor/construct among the meeting venues? What quantity and quality of ideas are generated for each of the meeting venues? Does a significant difference in quantity/quality exist among meeting venues? What are the perceptions of session observers toward six factors across meeting venues? Does a significant difference exist for observer factors among the meeting venues?

The qualitative piece, reported in the current paper, is designed to verify and deepen understanding of the quantitative findings, using the power of mixed methods to triangulate findings. The qualitative work describes perceptions of facilitators, participation and observers toward the effectiveness of each meeting venue. Common themes emerging from narrative description are identified and discussed at a preliminary level.

Significance

This study is significant because previous research studied primarily same-time, same-place meetings using face to face facilitation. Recent developments in web meeting technology have enabled different-place, different-time electronic meetings; however, to date, such meetings are described as not effective. Outcomes from this research are: (1) to develop processes to effectively facilitate meetings across time zones and (2) to refine a powerful applied learning experience for undergraduate students in the College of Business at Morehead State University.

Research Methods

This study used a mixed methodology mode that incorporated both quantitative and qualitative methods to triangulate results. Although mixed methods have been practiced since the 1950s, they are becoming a legitimate third paradigm, standing credibly with quantitative and qualitative methods (Becker, 2003; Ragin, 2003; Johnson & Christenson, 2005; Creswell, 2003; Flick, 2006). Collier, Seawright and Brady (2003) note the power of bridging (p. 73) which uses “nested analysis” to combine thick analysis with statistical tests, thereby strengthening both research traditions. Collier et. al. (2003, p. 74) posit that by combining qualitative and quantitative methods in creative ways, better research can result.

So far in the larger study, empirical surveys have been validated and quantitative data has been collected from 317 participants, 75 facilitators & 87 observers. A total of 479 have participated in the study. Table 1 summarizes the number of facilitators, participants and observers who have participated thus for each meeting venue. The current study incorporated an analysis of all comments provided by the 479 study participants.

Each meeting under study typically had 15-20 participants with 2-4 facilitators, plus 3-5 observers. The agenda and time format was controlled for each meeting. To simulate reality, study participants were varied for each meeting; they were trained and had freedom to infuse personality as desired within the time and agenda controls in the study. Each meeting used brainstorming and rating methods to conduct a 30 minute SWOT analysis of the participants’ work environment.

Table 1
Facilitation Mode by Study Participant Type

	Face to Face without EMS	Face to Face with EMS	Telecon-ference (audio) with EMS	Web Cam (audio video) with EMS	Asynch-ronous Web With EMS	Synch-ronous Web With EMS	Total
Participants	129	76	32	25	4	51	317
Facilitators	21	21	9	11	6	7	75
Observers	23	25	10	8	4	17	87
Total	173	122	51	44	14	75	479

To inform the larger study, over 200 research studies were reviewed. Quantitative data was analyzed using ANOVA with Tukey and Bonferroni post hocs, Pearson, Crosstabs, and Factor Analyses w/varimax rotation. To date, over 200 pages of quantitative tables with narrative interpretation have been produced and submitted elsewhere for journal publication. Additional data and narrative will be added from data collected December, 2005 and April, 2006, with updates forthcoming.

For the qualitative piece reported here, all narrative transcripts produced before December, 2005, were reviewed. Qualitative transcripts transcribed to date include 64 single spaced pages of observer narrative, 31 single spaced pages of participant narrative and 11 single spaced pages of facilitator narrative. The present study discusses only the qualitative component of the study. The qualitative results have not been disseminated elsewhere.

As illustrated in Table 1, qualitative narrative was collected from meeting participants, facilitators and observers. Three to five observers were present for each meeting; the role of the observers was to focus upon the effectiveness of the meetings. During each of the meetings, observers transcribed written comments online in response to open-ended questions regarding the effectiveness of the venue observed. Each participant and facilitator transcribed narrative online immediately after their meeting experience, noting strengths and weaknesses of the venue. In this manuscript, 106 single spaced pages of narrative transcripts from facilitators, participants and observers are summarized using a modified grounded theory approach. Item analysis was used to triangulate emerging qualitative themes with the quantitative results.

Grounded theory was used to interpret qualitative information. In grounded theory, the researcher tries to approach the problem with no preconceptions, building upward from transcripts into emerging themes. Multiple steps were used to apply this process. First the narrative was examined to discern common themes emerging for each venue. After common themes were identified, cross venue tables were developed. Finally, item analysis was conducted for each theme across venues. At this point, the emerging themes were cross checked with a model developed after an exhaustive review of the literature (McAlister-Kizzier, 2002). It was determined at this point that the themes emerging from the grounded theory approach verified and validated the constructs that emerged from previous work in this study. These steps served to both verify the qualitative piece used for the present study and also validate the quantitative research strategies used in the larger study. Thus triangulation was achieved for constructs and factors.

Results and Discussion

Since the verification methods used supported the constructs identified in quantitative work (McAliser-Kizzier, 2002), the results discussion is organized by five relevant verified constructs: problem solving, group processes, leadership commitment, bottom line and organizational issues. Each construct includes factors previously validated by McAlister-Kizzier (2002, 2004). The results tables in this section report item analyses scores, computed by examining comments in transcripts written by participants, facilitators and observers. The numbers in the tables reflect a composite score of comments from participants, facilitators and observers. To enhance interpretation, each factor in the tables in this section was examined from an encouraging and discouraging perspective.

Problem Solving

The first problem solving factor studied whether the venue was structured and focused on problem solving. The second factor addressed whether the venue had the ability to produce unique ideas of higher quality. Table 2 summarizes the item analysis for the problem solving construct.

Face to face venues were identified as being focused and smooth, providing effective reporting. The ability to focus on issues rather than technology was noted as a plus in the face to face without EMS venue. Very few recognized web methods as being focused and smooth or using effective reporting. Lack of nonverbal cues and confusion were noted as problems in web venues, especially in synchronous with EMS. The teleconferencing method was recognized as focused and smooth. In sum, content analysis suggested face to face venues as the most effective for structuring and focusing problem solving, with teleconferencing next most effective and the web approaches as the least effective.

Content analysis revealed the face to face venues as providing valid, honest and high quality ideas. However, this benefit was countered in the face to face without EMS venue where limited idea generation was reported. Synergy emerged as a strength of the face to face without EMS and asynchronous with EMS venues. A moderate number of comments noted both telecommunications with EMS and asynchronous with EMS as providing valid, honest, high quality ideas. All venues except asynchronous with EMS identified inadequate idea elaboration. In sum, content analysis suggested the face to face methods as providing the highest quality ideas, even though the number of ideas were limited. Telecommunications and asynchronous web, with EMS, seemed to hold promise for generated high quality ideas.

<i>Table2</i> <i>Problem Solving Item Analysis</i>						
Problem Solving Factors	Face to Face without EMS	Face to Face with EMS	Telecon-ference (audio) with EMS	Web Cam (audio video) with EMS	Asynch-ronous Web With EMS	Synch-ronous Web With EMS

is structured and focused on problem solving?						
Encouraging						
*Focused, professional, good control, on task, on time, smooth	88	71	40	1	7	3
*Effective reporting (immediate, clarified)	30	22	2		4	4
*Focus on issues (not technology)	6					
Discouraging						
*Lack of nonverbal cues makes it challenging to determine if problems/on task				6	4	7
*Report out could have been more valid	5					
*Confusing, unstructured, low focus and control	4	15	5	1	4	45
Has the ability to produce unique ideas of higher quality?						
Encouraging						
*Valid, honest, high quality ideas	50	76	24	3	17	
Non verbal feedback enabled clarification	3	1				
*Unique ideas		2		1		
*Synergy generated better ideas; more time to think, moving back and forth among issues	27				3	
*Easier to achieve consensus	1					
Discouraging						
*Inadequate idea elaboration	4	17	9	1		1
*Limited idea generation	11					
*Ideas not as creative	1					
*Lower quality ideas	1				2	1

Group Processes

The group processes construct includes five factors. Table 3 summarized item analysis for this construct, by factor.

The first group processes factor is whether the session was kept on task. The encouraging factors were discussed under the problem-solving construct. Content analysis suggested face to face venues as the most effective for keeping the session on task, with teleconferencing next most effective and web approaches as the least effective. Discouraging comments revealed such problems as being off task and empty gaps in discussion in face to face without EMS. Lack of nonverbal cues was identified as discouraging in teleconferencing and synchronous with EMS venues. Synchronous with EMS was identified as an especially confusing venue. In sum, analysis suggests face to face is the most effective and web-enhanced venues are the least effective for keeping a session on task. Non verbal cues for facilitators and lack of personal support for participants were identified as discouraging factors for non-face-to-face venues.

The second group process factor to emerge addressed minimization of gender inequities. See Table 3. Equal opportunity was noted for most EMS enhanced venues. A large number of comments noted inequitable participation in the face to face without EMS venue. A related group process factors, also illustrated in Table 3, examined achievement of equal participation because of anonymity and parallel input. For this factor, the EMS enabled venues outshined the face to face venue. Face to face, synchronous, and teleconferencing (all enabled by EMS) had a moderate number of comments noting equal participation. Discouraging comments gave additional insight, noting anonymity as impossible, inequitable participation and feelings of intimidated when called upon to speak. In sum, EMS-enabled methods overcame inequitable participation.

As illustrated in Table 3, the fourth group process factor addresses energy and group focus because of active participation. Personality, interaction, and motivational strategies were identified as holding interest across all six

venues. Some noted the hands-on engagement of EMS held interest. Many noted physical presence held interest in the four venues that incorporated audio, video or personal presence. An examination of the discouraging factors cited lack of interest, lack of human interaction and charisma and confusion as discouraging factors, most especially for the synchronous with EMS venue. The discouraging factor that popped out was technology discouraging effective communication across all venues, especially web-enhanced methods. In sum, all venues can hold interest, with synchronous with EMS being the most challenging to hold interest, possibly because of technological limitations in communication.

The final group process (see Table 3) looked at how the venues encouraged more objective idea evaluation. Although comfortable and open facilitation was noted across all venues, facilitator bias, inequitable participation and group dynamics bias were noted as potential constraints with the face to face with EMS facilitation mode. Anonymity is reported as a common factor in limiting objective idea evaluation in face to face venues.

<i>Table 3</i>						
<i>Group Processes Item Analysis</i>						
Group Process Factors	Face to Face without EMS	Face to Face with EMS	Telecon-ference (audio) with EMS	Web Cam (audio video) with EMS	Asynch-ronous Web With EMS	Synch-ronous Web With EMS
Has kept the session on task?						
Encouraging						
*Focused, professional, good control, on task, on time	88	71	40	1	7	3
*Effective reporting (immediate, clarified)	30	22	2		4	4
*Focus on issues (not technology)	6					
Discouraging						
Anonymity (cannot identify who responded)		2	1		1	2
Easy to get distracted, off task, Unavoidable distractions	8		1			4
Uneven input, gaps in flow (dropped off, slow start)	6					
*Lack of nonverbal cues makes it challenging to determine if problems/on task			7	1		7
*Confusing, unstructured, low focus and control	4	15	5	1	4	45
Has minimized gender inequities?						
Encouraging						
*Equal opportunity input/allows Diversity		5	4		2	7
Discouraging						
*Inequitable participation (some dominate, some do not participate)	43					
Achieved equal participation due to anonymity and parallel input?						
Encouraging						
Anonymity (more unique, honest ideas, less intimidating)		68	12	1	2	29
More participation, more ideas,	10	55	8	2	1	16

parallel input						
*Equal opportunity input/allows Diversity		5	4		2	7
More comfortable to type than to talk						
Discouraging						
Participants feel intimidated when are called upon to speak		28				
Anonymity impossible	26					
*Limited idea generation	11					
*Inequitable participation (some dominant some do not participate)	43					
Increased energy and group focus due to active participation?						
Encouraging						
*Can move among topics easily at own pace					3	4
*Hands-on engagement held interest		3	1	1		5
*Physical presence, personality, skill, natural interaction held interest	66	12	10	15		11
*Good interaction	27	1		15	14	21
*Can use motivational strategies, interesting, fun, exciting	3	12	1	17	3	24
Discouraging						
*Human interaction, feedback limited (not as effective as face to face, awkwardness as facilitator)		16	9	5	8	38
*Confusing, too unstructured, low focus and control	4	15	5	1	4	45
*No charisma, personality, no energy			3			4
*Difficult to verbally articulate thoughts clearly	2					
*Difficult to type/write			1			1
*Foreign language translation Challenges				1		
*Lose train of thought with constant Input	3					
*Boring, uninteresting	3					4
*Technology may discourage effective communication (speaker inadequate, slow, confusing, etc.)	25	26	32	17	7	109
*Participant hostility can hinder	3					
Encouraged more objective idea evaluation due to anonymity?						
Encouraging						
*Open participation; comfortable/non intimidating for facilitators/ participants; worked at own pace; positive	50	58	22		12	36
*Unbiased facilitation		12	3	3		7
Discouraging						
Group dynamics bias (1 st idea most important etc.)	8					
*Inequitable participation (some dominant some do not participate)	43					

Leadership Commitment

Six relevant Leadership Commitment factors issues emerged from the narrative. The encouraging and discouraging issues for each factor are identified in Table 4.

The first two Leadership Commitment factors examined whether leadership facilitation skills would either make a poorly planned meeting worse or a well planned meeting better. As illustrated in Table 4, facilitation and technology skill levels held by facilitators can effect all venues of meetings. The potential to make a poorly planned worse was most noticeable for face to face with EMS, a venue that requires both personal and technological skill levels. The effect seemed to be more evident for venues that enabled participants to visually view the facilitators.

Content analysis suggested that all venues were perceived as smooth and easy to facilitate and participate in; the positive influence of the facilitator was mentioned much more frequently in venues in which participants could see or hear the facilitator. In sum, comfortable, open facilitation was noted across all venues; however, facilitator bias, inequitable participation and group dynamics bias were noted as constraints for the face to face with EMS facilitation mode.

The next three Leadership Commitment factors addressed how effectively the various venues worked with diverse leadership styles, in diverse situations and with diverse organizational cultures. Item analysis (Tables 4) suggests EMS may help eliminate leadership struggle. The two face to face venues might infuse facilitator bias into meetings; EMS-enabled venues were perceived as offering unbiased facilitation. All venues except the web cam venue prompted comments describing a comfortable, open meeting environment that might lend itself to diverse situations and cultures. One concern was foreign language translation challenges.

In sum, all venues were perceived as easy in which to facilitate and participate; however facilitation and technology skill levels can affect all meeting venues. The effect of facilitator skill was most pronounced in venues in which participants could see and hear facilitators; the most dramatic effect appeared to be in the face to face with EMS meeting.

The final Leadership Commitment factor examined if venues could help resolve counter-productive conflicts between leadership styles. Although one comment noted face to face with EMS could eliminate leadership struggle; twenty comments noted that facilitator bias could be a concern with both face to face methods. In sum, all EMS venues foster an unbiased, comfortable, open environment that might lend itself to diverse situations and cultures. Face to face methods can infuse bias.

Table 4						
Leadership Commitment Item Analysis						
Leadership Commitment Factors	Face to Face without EMS	Face to Face with EMS	Teleconference (audio) with EMS	Web Cam (audio video) with EMS	Asynchronous Web With EMS	Synchronous Web With EMS
Has increased the likelihood of 'buy in' to the final recommendations? NA						
Would make a poorly planned meeting worse due to ineffective leadership/facilitation skills?						
Encouraging NA						
Discouraging						
Learning technology to prepare for facilitation is challenging	0	19	3	9	5	4
Facilitating skill level during session can hinder effectiveness	3	25	1	10		2
Facilitator personality can hinder/change interaction	6	7				
Would make a well planned meeting better due to effective leadership/facilitation skills?						

Encouraging						
Smooth, easy to facilitate and participate (not confusing)	62	23	31	1	23	17
Facilitator could enhance effectiveness	31	12	22	17		11
Discouraging NA						
Could be effectively used with diverse leadership styles?						
Encouraging						
*Eliminates leadership struggle						
Discouraging						
*Facilitator bias	13	7				
Could be effectively used with diverse situations?						
Encouraging						
*Unbiased facilitation		12	3			7
*Open participation; comfortable/non intimidating for facilitators/participants; v at own pace; positive	50	58	31		15	36
Discouraging						
*Facilitator Bias	13	7				
Could be effectively used with diverse organizational cultures?						
Encouraging						
*Unbiased facilitation		12	3			7
*Open participation; comfortable/non intimidating for facilitators/participants; v at own pace; positive	50	58	31		15	36
Discouraging						
*Technology may discourage effective communication (speaker inadequate, etc.)	25	26	32	17	7	121
*Foreign language translation challenges				1		
Could help resolve counter-productive conflicts between leadership styles?						
Encouraging						
*Eliminates leadership struggle		1				
Discouraging						
*Facilitator bias	13	7				

Bottom line issues

Four bottom line issues were examined, identified in Table 5. The first factor addressed whether venues could reduce labor costs through such factors as productivity increases, travel time savings, and the like. All venues were identified as efficient and effective, with the two face to face venues stimulating the most effectiveness comments. Synchronous also stimulated a number of effectiveness comments. All EMS enabled venues were mentioned as offering potential to save travel expenses. Face to face without EMS was identified as not mobile and expensive. Face to face with EMS was identified by many as being limited by time; most of these comments mentioned the meeting seemed too rushed, with participants and facilitators overloaded.

In sum, all venues were identified as effective, with face to face and synchronous EMS venues stimulating the most effectiveness comments. All EMS venues offered potential financial savings; however, face to face without EMS is not mobile and therefore expensive. Face to face with EMS participants and facilitators felt overloaded.

The second bottom line factor examined idea quality through anonymous constructive criticism. Table 5 illustrates that all venues were perceived as generating valid, honest high quality ideas, especially the face to face, teleconferences and synchronous venues. Synergy appeared especially evident in the face to face without EMS venue. All venues except web cam with EMS noted inadequate idea elaboration as a discouraging factor.

Face to face without EMS noted limited idea generation as a discouraging factor.

In sum, all venues generated valid, high quality ideas, especially face to face, teleconference and synchronous venues. Synergy appeared especially evident in the face to face without EMS venue. All venues except web cam with EMS noted inadequate idea elaboration as a discouraging factor. Face to face without EMS noted limited idea generation as a discouraging factor.

As illustrated in Table 5, the third bottom line factor looked at contribution to improved quality of meeting results. As noted elsewhere, all venues were perceived as efficient and effective; however, face to face without EMS and synchronous with EMS was perceived as “not effective” by some. A deeper analysis of comments suggests that reservations toward face to face without EMS stem from technological limitations, validity and low response rates. When EMS capability is added to face to face, more discouraging factors were mentioned, including time pressure, and avoidance of participation. With EMS came an additional factor that was mentioned for most EMS modes, that is, inappropriate or “silly” ideas. The potential for the technology to limit objective achievement was commonly mentioned, especially for synchronous with EMS.

In sum, although all venues were perceived as efficient and effective; face to face without EMS and synchronous with EMS was perceived as “not effective” by some. Problems with face to face without EMS included technology constraints, validity and low response. Adding EMS capability enhanced time pressure, participation avoidance, technology problems and inappropriate ideas

The final bottom line factor addressed participant satisfaction. See Table 5. Encouraging factors included ease of use for all venues, especially the face to face venues. The infusion of personality, motivational strategies and interaction was also noted as encouraging for all venues, especially face to face with EMS. All venues were also noted for the comfortable atmosphere, especially the face to face and telecommunications venues. Discouraging factors provided additional insight. Most notable was the potential for technology to discourage effective communication across all venues. Human interaction and personality limitations and confusion were noted as discouraging factors, especially for the synchronous with EMS mode.

In sum, all venues, especially face to face, were easy to use and comfortable and incorporated motivational strategies, including personality and interaction. However, technology could discourage effective communication across all venues. Most especially for synchronous with EMS, ineffective communication caused by limited technology and human interaction could enhance confusion.

Table 5						
Bottom line Item Analysis						
Bottom Line Factors	Face to Face without EMS	Face to Face with EMS	Telecon-ference (audio) with EMS	Web Cam (audio video) with EMS	Asynch-ronous Web With EMS	Synch-ronous Web With EMS
Could reduce labor costs through such factors as productivity increases, travel time savings, and the lik						
Encouraging						
Travel time savings		19	21	12	17	15
Efficient and effective	80	76	22	16	20	48
Discouraging						
Expensive (technology, travel, phone calls)	20	1	12			
Geographic limitations, not mobile	20	3	3			
Time limitations		23				
Could improve the quality of ideas through anonymous constructive criticism?						
Encouraging						
*Valid, honest, high quality ideas	50	76	24	4	17	65

*Unique ideas		2		1	3	
*Synergy generated better ideas; more time to think, moving back and forth among issues	27				3	
*Easier to achieve consensus	1					
Discouraging						
*Inadequate idea elaboration	4	17	9		4	15
*Limited idea generation	11					
*Ideas not as creative	1					
Duplicate ideas			5	5		
*Lower quality ideas	1				2	
Contributed to improved quality of meeting results?						
Encouraging						
Efficient and effective process	88	76	22	16	20	48
Discouraging						
Not effective	2					6
Validity questioned	4	17				24
Technology limited objective achievement	25	18	29	11	7	109
*Inadequate idea elaboration	4	17	9		4	1
Too rushed, not enough time		23				
Low response rate	11	17			14	2
Can avoid participation via anonymity		6	2		3	3
Inappropriate, inauthentic ideas, too relaxed, low control		47	15	1		17
*Report out not clear/invalid	5	17				15
Lead to higher participant satisfaction?						
Encouraging						
Easy to use technology	54	58	1	1	20	18
*Can move among topics easily at own Pace					3	
*Hands on engagement held interest		3	1	1		5
*Physical presence, personality/skill/natural interaction held interest	66	12	12	15	3	1
*Good interaction	66	1	12	15	14	21
*Can use motivational strategies, interesting, fun, exciting	31	12	19	18	14	14
Calm, relaxed, comfortable	38	58	31	1	17	9
Discouraging						
*Difficult to type/write			1			1
*Foreign language translation challenges						
*Lose train of thought with constant input	3		1			
*Boring, uninteresting	3					4
*Technology may discourage effective communication (speaker inadequate, etc.)	25	18	32	14	7	121
*Participant hostility can hinder	3					
*Human interaction, feedback limited (not as effective as face to face, awkwardness as facilitator)		24	16	6	4	38
*Confusing, too unstructured, low focus and control	4	15	5	1	4	45
*No charisma, personality, no energy			3		4	31
*Difficult to verbally articulate thoughts Clearly	2					

Organizational issues

As illustrated in Table 6, one organizational issue was addressed, that is, whether the venue could be used successfully at geographically dispersed sites. Not surprising, several comments noted that all venues that did not require a facilitator physically present could be used successfully at geographically dispersed sites. Complications caused by technology were frequently mentioned, most dramatically for the synchronous mode with EMS. The synchronous mode was also noted as being very confusing for those participating at a distance.

Table 6						
Organizational Issues Item Analysis						
Organizational Issues Factors	Face to Face without EMS	Face to Face with EMS	Telecon-ference (audio) with EMS	Web Cam (audio video) with EMS	Asynch-ronous Web With EMS	Synch-ronous Web With EMS
Could be used successfully at geographically dispersed sites?						
Encouraging						
Anytime, anyplace flexibility, low cost, convenience			9	12	20	12
Discouraging						
*Foreign language translation challenges				1		
*Technology may discourage effective communication (speaker inadequate, etc.)		18	32	14	7	121
Participation at a distance with technology confusing			3		4	45
Not mobile	20	3				

Conclusions

The following conclusions emerged from this preliminary analysis of the qualitative arm of this mixed method study: The conclusions are organized by the five EMS Constructs used in this paper.

Problem Solving:

1. Face to face without EMS is the most effective venue for structuring and focusing problem solving, with teleconferencing next most effective and the web approaches as the least effective.
2. Although the number of ideas is more limited without EMS, face to face methods provide the highest quality ideas. Telecommunications and asynchronous web with EMS, hold promise for generating high quality ideas.

Group Processes

3. Face to face venues are the most effective and web-enhanced venues the least effective for keeping a session on task. Lack of nonverbal cues for facilitators and lack of personal support for participants hindered web venues.

4. EMS-enabled venues support equitable participation.
5. Although all venues can hold interest, synchronous with EMS was the most challenged in holding interest, potentially because technology hindered communication.
6. Comfortable, open facilitation was noted across all venues; however, facilitator bias, inequitable participation and group dynamics bias were noted as constraints for the face to face with EMS facilitation mode.

Leadership Commitment

7. All venues were perceived as easy to facilitate and participate in; however facilitation and technology skill levels can affect all meeting venues. The effect of facilitator skill was most pronounced in venues in which participants could see and hear facilitators; the most dramatic effect appeared to be in the face to face with EMS meeting.
8. All EMS venues foster an unbiased, comfortable, open environment that might lend itself to diverse situations and cultures. Face to face methods can infuse bias.

Bottom Line

9. All venues were identified as effective, with face to face venues and synchronous EMS venues stimulating the most effectiveness comments.
10. All EMS venues offered potential financial savings; face to face without EMS was identified as not mobile and expensive.
11. Face to face with EMS participants and facilitators noted feeling overloaded and rushed for time.
12. All venues generated valid, high quality ideas, especially face to face, teleconference and synchronous venues. Synergy appeared especially evident in the face to face without EMS venue. All venues except web cam with EMS noted inadequate idea elaboration as a discouraging factor. Face to face without EMS noted limited idea generation as a discouraging factor.
13. Although all venues were perceived as efficient and effective; face to face without EMS and synchronous with EMS was perceived as “not effective” by some. Problems with face to face without EMS included technology constraints, validity and low response. Adding EMS capability enhanced time pressure, participation avoidance, technology problems and inappropriate ideas.
14. All venues, especially face to face were easy to use and comfortable and incorporated motivational strategies, including personality and interaction. However, technology could discourage effective communication across all venues. Especially for synchronous with EMS, ineffective communication caused by limited technology and human interaction could enhance confusion.

Organizational Issues

15. All venues except face to face could be successful at geographically dispersed sites. Complications caused by technology were frequently mentioned as limiting participation at a distance, most dramatically for synchronous with EMS.

Recommendations

The following recommendations are offered to guide future research.

1. Results from this study should be triangulated with quantitative results to enhance understanding of the effectiveness of meeting venues.
2. Emerging venues should be added to the effectiveness studies, e.g., pod casting, etc.
3. Other populations, cultures and meeting purposes can be incorporated into the research.
4. An effectiveness model should be developed, stemming from results of the larger study..

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