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**AN INSTRUMENT FOR MEASURING MEETING SUCCESS:
REVALIDATION AND MODIFICATION[†]**

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Abstract

The development and validation of an instrument to measure meeting success has been described in earlier work. This instrument is now revalidated in organisational meetings where Group Support Systems (GSS) were employed to support meeting processes. In addition, a derived version of the instrument for measurement of longitudinal meetings is introduced.

Keywords

Group Support Systems (GSS); Instrument Revalidation; Longitudinal Meetings; Meeting Success

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1 Introduction

"Meetings are a nearly ubiquitous feature of organisational life, yet they are seldom as successful or as productive as we would like" [3]. Research conducted over the last fifteen years suggests that meetings using a Group Support System (GSS) can achieve significantly higher levels of productivity and participation, while generating time and cost savings [9, 12] and increasing participant satisfaction with meetings, when compared to meetings that do not have GSS support. While the research evidence is somewhat inconsistent, a major difficulty in research of this type has been the identification and measurement of those factors considered critical to a meeting's success. Pervan [10] has observed that in most studies, researchers have chosen their own measures for each type of 'success' indicator. Furthermore, the measures employed have often been sketchily reported, with little attempt to justify or validate their use.

In earlier work, we developed an instrument to measure the success of meetings. The population sampled came from a large university in Hong Kong, and all data collected related to meetings that did not have GSS support. The validated instrument incorporated five constructs: communication, teamwork, discussion quality, status effects, and efficiency. While construct reliability and factor loadings were generally high, we cautioned that further validation and analysis of the instrument would be desirable.

2 Application Context of the Original Instrument

As part of an extended program of research (see [5]), the original instrument was applied in a number of meeting environments in three organisations in Hong Kong. The rationale was not simply to undertake further validation work on the instrument itself, but to use GSS to support organisational meetings and to measure the success of these meetings with the instrument. An action research methodology was employed to guide the use of the GSS. (For a comprehensive account of action research, see [1, 2, 7, 8, 11, 15]). While this choice of methodology was not critical to the validation of the instrument itself, it did mean that the researcher maintained very close contact with the meeting participants, and this contact enabled the researcher to achieve a deep understanding of the issues faced by the participants. Thus the value of the instrument as a means of collecting participant perceptions of meeting processes came under intense scrutiny.

2.1 University Strategic Planning Meetings

In August 1996, two meetings were held at the same university in Hong Kong as had provided the population for the original study. These meetings involved strategic planning for the annual Faculty retreat. The meeting activities included electronic idea generation, categorisation, and prioritisation. Twelve members of the academic staff of the Faculty of Business participated in the first meeting, whereas nine did in the second. The instrument was used to collect feedback on meeting processes from participants of both occasions.

2.2 *Royal Hong Kong Police Force*

From November 1996 to March 1997, a series of nine meetings were held with officers of the then 'Royal' Hong Kong Police Force [4]. In these meetings, junior officers on a management skills training course were required to engage in a problem solving discussion, eventually generating an action plan. Two problems were devised by the researcher in collaboration with a senior police officer responsible for the training course. These problems involved: the repatriation of Vietnamese refugees; and the combating of rampant CD-ROM piracy. Officers were free to use the GSS to brainstorm and organise ideas, create possible solution components, and finally group-author an action plan. A total of fifty three officers participated in the meetings, with the GSS additionally used to administer the research instrument.

2.3 *Stable Loan*

From January to June 1997, a series of eleven meetings were held in Hong Kong at the offices of Stable Loan (a pseudonym), a medium-sized, international, management accounting firm that employs some two hundred people. The purpose was to re-engineer the process whereby the firm billed its clients. This involved extensive analysis of current billing procedures, discussion of weaknesses in the process, identification of examples of good practice and the subsequent development of a plan for a new billing process - to be approved by the firm's senior partners. The GSS was used extensively in the idea generation and deliberation stage of the project, with data collected from participants on five occasions. The project group

consisted of six members from different divisions of the firm. The original research instrument was used on the first two occasions to collect data, but a revised instrument was used in the latter three. The reasons for the development of a revised instrument relate to its appropriateness in measuring changes over time in longitudinal meetings.

3 Revalidation Analysis

An examination of the data collected across all the meetings reveals that the communication construct was the one that received the most consistent data, with all groups indicating that no communication difficulties occurred. This finding was not altogether unexpected, as English was used as a medium of communication in all cases: all group members were generally well educated and could be expected to use English on a regular basis in their work.

Confirmatory factor analysis of the communication construct (see Table 1) indicates that the items load together even more strongly than found in our initial analysis, and the alpha score is also significantly stronger. For the sake of easy reference, the scores from the original analysis are also presented.

Insert Table 1 About Here

As far as the discussion quality construct is concerned, the perceived levels of quality have generally been high, or seen as improving. Respondents did not query the construct components, but proposed that an

additional effect of anonymous group discussion is its honesty or sincerity. Specifically, it was suggested that the pressure to conform to an approved viewpoint is significantly reduced. This viewpoint is also considered by Dennis [6] who notes that credibility may be reduced when statements are contributed anonymously. The openness component of the construct was designed to include sincerity, but substituting sincerity for openness clarifies the question for future instrument respondents.

We previously described how item D3 was removed from the *validated* instrument and D4 was reworded. Nevertheless, both D3 and the reworded D4 were employed throughout the cases described here. Confirmatory factor analysis of data from all the cases now provides evidence to show that all four factors can be safely included - see Table 2 - since factor loadings and the alpha scores are very high. However, further revalidation will be necessary in future if item D3 is to change from measuring openness to sincerity.

Insert Table 2 About Here

The third meeting process construct involves 'status effects' - those exerted by persons of higher status. These were perceived to be important components, since the effects of process losses caused by status effects are well established. The groups we have supported in this research have generally been free of status related problems. Status differences were ignored in the University case, while in the Stable Loan case, although status

effects were perceived, they apparently did not have an impact on the willingness of group members to participate.

Revalidation of the status effects data reconfirms the cohesiveness of the construct, all four items binding tightly together with a very high alpha score - see Table 3.

Insert Table 3 About Here

The fourth meeting construct is 'teamwork'. In the University case, the non-responsiveness of group members to others' questions was criticised, indicating that it is important. In the Police case, the training officer provided an unusual channel for information access, answering questions about procedures and providing new 'government policy' information while the task was in progress. This was conducted on-line, with the training officer distinguishing his contributions from those of the other officers by his use of upper case script. In the Stable Loan case, participants expressed public willingness to participate, but in practice were unwilling to do so, privately informing the researcher that they believed their involvement in the process was unnecessary. The participants did not normally work as a team, and their inclusion in the re-engineering group was somewhat arbitrary, hence there was little team spirit present.

As exhibited in Table 4, factor analysis indicates that the three items do still hold together, but the alpha score has dropped compared to our earlier analysis.

Insert Table 4 About Here

Meeting efficiency proved to be of vital importance, as time was often severely circumscribed. The thoroughness of idea discussion appeared to be directly dependent on the amount of time available, with some group members in the University case complaining that the inadequate length of the meeting prevented thorough discussion. The percentage of time devoted to serious discussion fluctuated from group to group, and we suspect that the question is ambiguous as time can be usefully spent on activities other than serious discussion - voting or just thinking, for example.

Confirmatory factor analysis of the efficiency construct reflects these problems, particularly in the result orientation of the meeting and the amount of time spent on serious discussion. While the four items of the construct do appear to hold together, the alpha score is rather low.

Insert Table 5 About Here

In addition to the five meeting constructs, we asked meeting participants for their perceptions of the technology used. Further we employed two criterion variables to examine outcome-related perceptions of a meeting - measuring the overall satisfaction that meeting participants experienced and the extent to which consensus was achieved in a meeting. While the two technology-related questions were useful for tracking the relative comfort that meeting participants experienced, the two criterion variables proved rather less useful. We believe that both consensus and

satisfaction are complex constructs, and are hence inappropriately measured by single questions. Indeed, at least thirty components of a potential satisfaction construct have been identified [14].

4 Development of the Derived Instrument

In the Stable Loan case, we employed the original research instrument on two occasions. Following the second usage, the leader of the meeting - also the firm's Chief Information Officer - observed that it would be more useful to complete a modified instrument that would measure the items on a comparative basis, i.e. directly comparing the current week's activities with the previous one's. The instrument was redesigned on this basis. The demographic questions were eliminated from the questionnaire altogether as this data was neither expected to change nor had it proved very useful. Most of the scales used were revised from 5-point to 3-point Likert values, and the wording of some questions was changed to make the English syntax meaningful. The full version of the redesigned instrument can be found in the Appendix.

The redesigned instrument was used on three occasions with the Stable Loan re-engineering group. Data collected using the revised instrument clearly showed how scores for items had either improved, stayed the same or deteriorated. However, a 'stay the same' score should not necessarily be interpreted negatively, since the previous week's score may already be positive. This form of information allowed the researcher to identify which processes needed attention. Thus, if status influence was perceived as increasing, the researcher could act to minimise this influence,

for example by intervening more directly in meeting processes. Such intervention is encouraged in action research, where the researcher has an obligation to work for the benefit of the group as a whole.

5 Conclusions

The revalidation of the meeting success instrument reveals that while three of the constructs remain strong, two others are not and may require further investigation. Satisfaction cannot simply be reduced to "Were you satisfied with meeting processes and outputs?" as is often encountered in the literature, since a considerably richer conception of satisfaction can be considered. Consensus is critical, since it is likely to exert a considerable impact on meeting success. However, we caution that consensus is a culturally loaded concept, and hence should be interpreted with care [cf.13].

The modified version of the instrument has not been statistically validated, since it has only been applied in three meetings. However, it has been qualitatively validated through its successful application in an action research context, where it revealed trends in meeting processes invaluable to successful meeting facilitation. Indeed, it is recommended that the modified instrument be used in meetings where not only can longitudinal processes be assessed, but also where a researcher or practitioner has the mandate to intervene, reacting to measured changes so as to improve the group's performance.

Appendix - Instrument Items

Revalidated Version

With regard to your own participation in the meeting, please indicate to what extent you agree with the following statements:

The language of the meeting prevented you from participating. (C1)

Strongly Agree 0 0 0 0 0 Strongly Disagree

You found it hard to understand other group members when they talked. (C2)

Strongly Agree 0 0 0 0 0 Strongly Disagree

You experienced problems expressing yourself. (C3)

Strongly Agree 0 0 0 0 0 Strongly Disagree

You felt reluctant to put forward your own ideas. (C4)

Strongly Agree 0 0 0 0 0 Strongly Disagree

You experienced pressure, either to conform to a particular viewpoint or not to contradict others. (S4)

Strongly Agree 0 0 0 0 0 Strongly Disagree

With regard to all meeting members as a whole, how would you rate the discussions in the meeting in terms of the following scales?

Meaningful 0 0 0 0 0 Meaningless (D1)

Appropriate 0 0 0 0 0 Inappropriate (D2)

Open 0 0 0 0 0 Closed (D3)

Imaginative 0 0 0 0 0 Unimaginative (D4)

Please indicate to what extent you agree with the following statements:

Other members appeared willing to answer questions when asked. (T1)

Strongly Agree 0 0 0 0 0 Strongly Disagree

Members worked together as a team. (T2)

Strongly Agree 0 0 0 0 0 Strongly Disagree

Members had sufficient access to the information they needed so as to participate actively in and fully understand the meeting. (T3)

Strongly Agree 0 0 0 0 0 Strongly Disagree

The time spent in the meeting was efficiently used. (E2)

Strongly Agree 0 0 0 0 0 Strongly Disagree

Issues raised in the meeting were discussed thoroughly. (E3)

Strongly Agree 0 0 0 0 0 Strongly Disagree

Some group members tried to intimidate others, e.g. by talking loudly, using aggressive gestures, making threats, etc. (S1)

Strongly Agree 0 0 0 0 0 Strongly Disagree

Some group members tried to use their influence, status or power so as to force issues on the other group members. (S2)

Strongly Agree 0 0 0 0 0 Strongly Disagree

You felt inhibited from participating in the discussion because of the behaviour of other meeting members. (S3)

Strongly Agree 0 0 0 0 0 Strongly Disagree

What percentage of meeting time do you think was spent on serious discussion?

___ % (E4)

To what extent would you say that this meeting was result oriented? (E1)

Strongly Result Oriented 0 0 0 0 0 Weakly Result Oriented

Modified Version

Compared to previous meetings of this team, do you feel that:

Your ability to participate in the meeting (C1)

Improved 0 *Stayed about the same* 0 *Deteriorated* 0

Your understanding of the typed comments from other group members (C2)

Improved 0 *Stayed about the same* 0 *Deteriorated* 0

Your ability to express yourself (C3)

Improved 0 *Stayed about the same* 0 *Deteriorated* 0

Your willingness to put forward ideas (C4)

Increased 0 *Stayed about the same* 0 *Decreased* 0

The pressure you experienced, either to conform to a particular viewpoint or not to contradict others (S4)

Increased 0 *Stayed about the same* 0 *Decreased* 0

Compared to previous meetings of this team, do you feel the discussions improved, stayed the same or deteriorated on the following scales:

Meaningful (D1) *Improved* 0; *Stayed about the same* 0; *Deteriorated* 0

Appropriate (D2) *Improved* 0; *Stayed about the same* 0; *Deteriorated* 0

Openness (D3) *Improved* 0; *Stayed about the same* 0; *Deteriorated* 0

Imaginative (D4) *Improved* 0; *Stayed about the same* 0; *Deteriorated* 0

Compared to previous meetings of this team, do you think that:

The willingness of other members to answer questions when asked (T1)

Increased 0 *Stayed about the same* 0 *Decreased* 0

The extent to which members worked together as a team (T2)

Increased 0 *Stayed about the same* 0 *Decreased* 0

The extent to which members had sufficient access to the information they needed so as to participate actively in and fully understand the meeting (T3)

Increased 0 *Stayed about the same* 0 *Decreased* 0

The time in the meeting was used (E2)

More efficiently 0 *As efficiently* 0 *Less efficiently* 0

Ideas were discussed (E3)

More thoroughly 0 *As thoroughly* 0 *Less thoroughly* 0

The extent to which some group members tried to intimidate others, e.g. by talking loudly, using aggressive gestures, making threats, etc. (S1)

Increased 0 *Stayed about the same* 0 *Decreased* 0

The extent to which some group members tried to use their influence, status or power so as to force issues on the other group members (S2)

Increased 0 *Stayed about the same* 0 *Decreased* 0

The extent to which you felt inhibited from participating in the discussion because of the behaviour of other meeting members (19, S3)

Increased 0 *Stayed about the same* 0 *Decreased* 0

What percentage of this meeting's time do you think was spent on serious discussion? ____% (20, E4)

To what extent would you say that this meeting was result oriented? (21, E1)

Strongly Result Oriented 0 0 0 0 0 Weakly Result Oriented

Additional Instrument Items

How would you rate your overall level of satisfaction with the meeting?

Strongly Satisfied 0 0 0 0 0 Strongly Dissatisfied

To what extent was consensus achieved in the meeting?

Strongly Achieved 0 0 0 0 0 Weakly Achieved

How comfortable do you feel using the technology?

Very Comfortable 0 0 0 0 0 Very Uncomfortable

To what extent did the technology hinder/facilitate your participation in this meeting?

Strongly Hindered 0 0 0 0 0 Strongly Facilitated

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Table 1 Communication

Item Ref.	Item Name	Factor Loadings	Original Loadings [3]
C1	The language of the meeting prevented participation	.93	.73
C2	It was hard to understand other participants when they talked	.87	.67
C3	You experienced difficulty expressing yourself	.88	.82
C4	You felt reluctant to put forward your own ideas	.89	.72
	Eigenvalue	3.17	2.16
	% of variance explained	79.2%	54%
	Cronbach's Alpha	.91	.71

Table 2 Discussion Quality

Item Ref.	Item Name	Factor Loadings	Original Loadings [3]
D1	Discussions in the meeting were: meaningful - meaningless	.92	.90
D2	Discussions in the meeting were: appropriate - inappropriate	.91	.78
D3	Discussions in the meeting were: open - closed	.90	-
D4	Discussions in the meeting were: imaginative - unimaginative	.81	.91
	Eigenvalue / % of variance explained	3.13 78.4%	2.75 74.9%
	Cronbach's Alpha	.90	.83

Table 3 Status Effects

Item Ref.	Item Name	Factor Loadings	Original Loadings [3]
S1	Some participants tried to intimidate others verbally, or with threatening gestures	.96	.79
S2	Some participants tried to use status or power to force issues on others	.93	.84
S3	You felt inhibited from participating because of the behaviour of others	.93	.82
S4	You experienced pressure to conform to a particular viewpoint	.79	.62
	Eigenvalue / % of variance explained	3.27 81.8%	2.41 60.1%
	Cronbach's Alpha	.93	.77

Table 4 Teamwork

Item Ref.	Item Name	Factor Loadings	Original Loadings [3]
T1	Participants appeared willing to answer questions	.77	.80
T2	Participants worked together as a team	.71	.85
T3	Participants had sufficient access to information to be involved in the meeting	.80	.81
	Eigenvalue / % of variance explained	1.73 57.6%	2.02 67.3%
	Cronbach's Alpha	.63	.76

Table 5 Efficiency

Item ref.	Item Name	Factor Loadings	Original Loadings [3]
E1	To what extent was this meeting result-oriented?	.55	.74
E2	The time in the meeting was efficiently used	.75	.84
E3	Issues raised in the meeting were discussed thoroughly	.81	.81
E4	What percentage of meeting time was spent on serious discussion?	.53	.66
	Eigenvalue / % of variance explained	1.80 44.9%	2.34 58.5%
	Cronbach's Alpha	.55	.76