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Towards a theoretically based Group Facilitation Technique for Project Teams

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Abstract

A theoretical framework for developing the group facilitation technique PROMOD is presented here. The efficiency of this technique in improving group decision quality is supported by the results of three experimental studies involving different kinds of problem solving tasks. The author points towards the importance of integrating theoretical assumptions, theory testing and basic research with empirical application. Such a compelling strategy can lead to new insights in group performance dynamics as well as further developments in this field, as it provides the necessary conditions to systematically initiate positive effects and to prevent negative effects during group interaction. In all three experiments the teams observed performed best when the PROMOD procedure was applied.

Key Words: Group Decision Making, Group Performance , Shared View Effect, Facilitation Techniques for Groups, Synergetic Effects

Introductory remarks

For about the last 50 years we have been aware of the inadequacy of group decision making (Davis, 1996; Hinsz, Tindale & Vollrath, 1997; Kerr & Tindale, 2004). The popular assumption that groups show greater aptitude at problem solving tasks than individuals has been refuted by a vast amount of intensive research. Only very few exceptions to those results could be published (Laughlin, Zander, Kinevel & Tan, 2003).

The time has come to shift the emphasis of social psychology research onto the question of how groups can be enabled to achieve greater problem solving quality. Instead of continuing to point out the effects of process losses, research should focus on the development of group facilitation techniques which produce process gains and synergetic effects when people make decisions in committees or project teams (Messé, Hertel, Kerr, Lount & Park, 2002).

Today we can say that project teams comprising experts of various fields of knowledge have been established on a world-wide scale. The cooperation of such experts aims at finding the most optimal solutions possible for complex problems in an increasingly complex world. This procedure is closely connected to the idea that teams are able to successfully integrate various pertinent viewpoints, thereby improving the quality of solutions and decisions. Instead, process losses in groups cause considerable productivity-losses concerning all areas of society. Supposing we were able to support project teams in improving the quality of their decisions and solutions for complex problems by developing efficient group techniques, then small-group research could again occupy a central place in social psychology.

Although primarily a field of applied research, it seems to be important to simultaneously develop theoretical baseline-models which serve as supporting stimulation for applied approaches to this field of research, and provide a basis for the development of techniques, a framework for the integration of various data, as well as an instrument to disclose and explain the inconsistencies occurring in results. Mutual inspiration is needed. Up till now there has been almost a total lack of theoretical background which could guide empirical procedures (Katzenstein, 1996). The well-known brainstorming technique was introduced without any theoretical baseline and no fundamental research. Endeavours to find theoretical explanations why brainstorming does not show the expected effects have only recently begun (see Nijstad, Stroebe & Lodewijkx, 2003).

Starting points

Following facts are taken as a basis for further considerations:

a. Increasing complexity of all societal systems requires the cooperation of various experts to solve highly complex problems and to take decisions for future societal developments.
b. In general, team-members believe in the high quality of group decisions per se.
c. In contrast, research on small group performance shows process losses which lower the quality of group decisions and increase the probability of inadequate solutions.
d. Group techniques like
   - Group facilitation techniques (i.e. Delphi method)
   - Discourse techniques (i.e. Brainstorming) and
   - Group development techniques (i.e. Encounter groups)

   do not lead to sophisticated group decisions (Dalkey & Helmer, 1963; Osborn, 1957; Rogers, 1970, Katzenstein, 1996, Moore, 1987, Rogelberg, Barnes-Farrell & Lowe, 1992, Schweiger, Sandberg & Ragan, 1986, Innami, 1994).

Group performance: Facilitative and inhibitory conditions

A substantial criterion for group techniques is their capacity to enforce facilitative elements of group processes and to reduce inhibitory processes. Therefore the analysis of facilitative and inhibitory conditions for group performances is fundamental. Several of those conditions are already well-known. We can distinguish effects on individual and on group level on the one hand, and on the other hand, cognitive, emotional and behavioral processes on both levels.

Attempts to improve group performance by structuring the discussion process have not proved sufficiently successful, as group dynamic phenomena still have a negative influence on group productivity ("majority wins", social loafing, shared view, choice shift, group think). Thus, group interaction has to be reduced to a minimum, individual positions have to be strengthened and individual motivation has to be supported.

Widespread assumptions that "emotional" group cohesion per se leads to better group decisions have been disproved (Mullen & Copper, 1994).
Against the background of the above mentioned phenomena of group dynamic influences on group decision quality (Kerr & Tindale, 2004), following postulates are considered fundamental to improving group performance results:

1. The higher the quality of individual input regarding subject matter at the beginning of the group interaction, the higher the quality of the group performance (Lorge & Solomon 1955; Grofman 1978; Sorkin, Hays & West 2001).
2. The more individual inputs are independent of one another at the beginning of the group interaction, the higher the quality of the group performance (Sorkin, Hays & West 2001).
3. The more the group performance includes individual input, the higher the quality of the group performance (Hinsz, Tindale & Vollrath 1997).
4. The more comprehensible the individual input is for each group member, the higher the quality of the group performance (Libby, Trotman & Zimmer 1987).
5. The more high quality individual input influences the final group decision, the higher the quality of the group performance (Littlepage, Schmidt, Whisler & Frost 1995).

Normative influences on group performance processes can manipulate and distort the informational integration of individual input (Hinsz, Tindale & Vollrath 1997) and should therefore be reduced to a minimum. The general maxim for a group facilitation technique for project teams has to be read as follows:

- Maximize the informational influence on the group performance process,
- minimize the normative influence on the group performance process,
- optimize the influence of individual input on the final group decision (see formula 3).

Project teams often comprise experts of various subject areas. Each of those experts has specialized knowledge which other group members do not have (unshared knowledge). In addition the group's resource includes knowledge which is at the disposal of all group members (shared knowledge). Conformity processes, as part of normative pressure in groups, result in primarily shared knowledge entering into a consensual group decision, and specialized knowledge remaining unnoticed (shared view effect). Thus, unique resources of single group members have to be explicitly extracted and communicated to the group (Hoffman, Shadbolt, Burton & Klein, 1995). The importance of each contribution of knowledge regarding the group decision should then be evaluated by the group. Therefore all comments, arguments and individual positions must be presented to the group in a clear and comprehensible way, as they cannot be taken for granted per se, especially so as specialists in a certain field often tend to underestimate the complicated nature of their expertise. To sum up: the quality of group performance regarding non-heureka tasks considerably depends on the addition of shared and unshared knowledge in groups and its evaluation (weight). This postulate was formalized by Shiflet (1979): General model of group productivity

$$P = \sum_{i=1}^{n} X_i \cdot C_i + \sum_{i=1}^{n} Y_i \cdot D \qquad (1)$$

P: group performance

X_i: weight reflecting the importance of unshared knowledge contributions

C_i: unshared knowledge contributions of individual i

Y_i : weight reflecting the importance of shared knowledge contributions

D: shared knowledge contribution

The quality of group performance not only depends on the cross-section of shared and unshared knowledge but also on the extent of relating the knowledge to the task; in other words, putting the knowledge to use in the task-handling (Greitemeyer & Schulz-Hardt, 2003) leads to further postulates:

6. The more the individual knowledge of all group members is linked to the requirements of task performance, the higher the potential of the group performance.
7. The more this individual knowledge of group members is independent from each other the more the potential performance of the group is reached.

These postulates can be formalized as follows:

$$PP = \left(\bigcup_{i=1}^{n} C_i\right) \cap T = (C_i \cap T) \cup (C_{i+1} \cap T) \cup (C_{i+2} \cap T)... \qquad (2)$$

PP: potential performance of the group

$\cup C_i$: the logical union of all members' independent resources

C_i: unique resources of each group member

$\cap$: logical cross-section

T: all (nearly infinite) elements of the task

$\cup$: logical union of single elements

In some cases the sum knowledge of a group is not sufficient to solve a problem in a high quality manner. The unfavourable selection of group members for a certain task can, of course, not be compensated by any group facilitation technique.

The combination of the two a.m. formulas shows that X_i (weight reflecting the importance of unshared knowledge contributions) should be a function of $(C_i \cap T)$, which is of vital importance for reaching a group performance (P) which comes near to the potential performance (PP) of a group:

$$X_i = f(C_i \cap T) \qquad (3)$$

The meaning of shared knowledge contribution (Y_i) has to be seen as a function to initiate, control and steer a normatively organized group dynamic process, as group members like to discuss shared knowledge, increasing the willingness to tackle with the task. Nevertheless and precisely therefore it has to be emphasized that those normative processes distract from important unshared knowledge exchange and in consequence hinder an optimal group performance (PP). The maxim of an efficient group facilitation technique is to reduce the shared knowledge contribution to a minimum ($Y_i \rightarrow 0$) and to maximize informational influence of unshared knowledge.

Combining the postulates from basic research to find a group facilitation technique as a complex application leads to the following postulate:

8. The more a group facilitation technique enables the realisation of the above quoted conditions in a group setting (postulates 1 to 5), the higher the quality of the group performance and the more the performance comes closer to the potential performance (PP).

Without any group facilitation technique free interacting groups are seldom able to follow the conditions necessary for efficient group performance (Davis 1992).

The development of a group facilitation technique for project teams

Above mentioned postulates require adequate pragmatic implementation when developing a group facilitation technique for project teams. The group facilitation technique PROMOD has been developed in accordance with the considerations stated below (Lecher & Witte, 2002; Witte & Sack, 1999). Its main characteristics consequently realize following conclusions.

Derivations from Postulate 1:

In order to increase the individual member's quality of performance, the specialized knowledge has to be elicited by a structured and individual-oriented technique which also aims to prevent social loafing and free-riding effects (Hoffman et al. 1995; Scheele & Groeben 1988).

Derivations from Postulate 2:

In order to support subjective points of view independent of other subjects' opinions and under no influence of conformity pressure, group members first develop their own arguments and problem solving strategy without any personal contact to other group members. A facilitator for each group member gives social-emotional feedback and motivational support and provides a common structure for eliciting the knowledge of each expert.

Derivations from Postulate 3:

In order to consider all individual information, this should be exchanged among the group members in a condition which excludes any normative influence. Consequently all information will be passed on anonymously.

Derivations from Postulate 4:

In order to achieve a high general comprehension of each specialized analysis of the topic, the facilitator pays attention to a logical and clear explanation of thoughts and opinions, of course without any interference in terms of content.

Derivations from Postulate 5:

In order to integrate all high quality information into the final group decision the facilitator tries to minimize any irrelevant influences, e.g. extraversion of the author, talkativeness or other social characteristics (Littlepage et al. 1995). The anonymous procedure of exchanging information facilitates an objective evaluation of this information. Furthermore, the integration rule for the final group product should be formulized from outside by consensus or majority vote.

General assumptions:

A group facilitation technique which sticks to the above mentioned derivations from the postulates should

- maximize the informational influence on the group performance process,
- minimize the normative influence on the group performance process and
- optimize the influence of individual input on the final group decision,

in line with the three prerequisites of our general maxim for an efficient group facilitation technique

To test the effectiveness of the PROMOD technique we conducted three experiments introducing three different tasks and various modified conditions of working with these tasks. The results of PROMOD groups were compared with those of groups interacting without any group facilitation technique (control groups) or less structured techniques (alternative techniques). The first two experiments which will be presented here have been published in German language, the third one is still unpublished. In order to demonstrate the development and the evaluation of the PROMOD technique, we present the results of all three experiments performed over a period of ten years.

Table 1:
<u>Experiments</u>

Experiment 1:	task: Technology assessment: Modification of vegetables by genetic engineering and its consequences (Scherm 1996)
Experiment 2:	task: Computer simulation: Prevention of an epidemic in a large city (Doerner 1979; Funke 1992; Frensch & Funke 1995; Witte & Sack 1999)
Experiment 3:	task: 'Desert Survival Problem': 15 objects have to be rank-ordered according to their importance for survival in a desert after an aircraft crash: Lafferty & Pond 1974 (still unpublished)

The tasks used in experiment 1 and 2 are highly complex. The quality of group performance in experiment 1 and 2 depends not only on the quality of inventions proposed, but also on the quantity of interventions submitted. The task used in experiment 3 is a ranking task and compared with the former tasks highly structured per se. As the efficiency of PROMOD, amongst other effects, essentially results from a stringent structure for eliciting expert knowledge, it was our intention to verify if an additional increase of group decision quality can still be achieved by applying the PROMOD group facilitation technique when working with this highly structured and well-known task.

Experiment 1: Technology Assessment (Scherm, 1996)

Method

<u>Participants and Design</u>

The subjects of the group setting comprised 72 students of various faculties of the University of Hamburg: Biology (24 students), pedagogy or psychology (24 students) as well as economics (24 students); 22 female and 48 male subjects. All had completed their first examination, comparable to a BA, the average age of the random sample was 25. The subjects received no remuneration except the reimbursement of their travelling costs.

N = 12 groups had been working under ProMod conditions and N = 12 groups had been working not guided by any facilitation technique (control groups).

Experimental Task

All subjects were given written instructions on how to conduct a technology assessment of cultivating plants with herbicide-resistance methods of gene modification. The written information depended on the discipline of the students: students of biology received ecological aspects of the subject, economic aspects of the subjects were given to the students of economics and students of pedagogy and psychology were informed about the social consequences of such a development

Procedure

3-person-groups (N = 3 * 24 = 72) discussed their point of view and had to present a written statement about the ecological, economic and social consequences of the implementation of a technique as described above. The whole discussion was split into two parts lasting about 90 minutes each.

The protocols were evaluated on a scale called 'problem-solving-quality' with 5 items (Crombach's $\alpha = 0.90$) and a general item about the general quality of the text. All items were rated on the 5-point-Likert-scale by 48 subjects of an average age of 25. Half of the sample, which evaluated the quality of performance, were participants of the prior group discussions the other half were students of psychology not involved in the subject. No difference between both sub-samples, considering the evaluation, was evident.

Control condition: Group discussion of a 3-person-group, no group facilitation technique was introduced.

PROMOD-Condition: Each of the three group-members was assigned to his or her facilitator, who highly structured the individual process of performing the task according to a general scheme consisting of several steps of how to tackle the task.

After having written an individual draft, and exchangig the individual draft the group's majority decided which parts or elements of the individual draft should be integrated in a final group protocol.

Results

The data have been analysed by t-tests considering the quantity of consequences presented as an average of all groups working under the same conditions as well as the valuation-quality of the texts in general.

Table 2:
t-tests of the mean number of consequences given in the text protocols of the control groups in comparison with the experimental groups (N=12)

Area	Mean		Standard deviation		t-value	p	Effect size
	Control	Exp.	Control	Exp.			
Ecology	2.0	3.4	2.2	1.7	- 1.79	0.045	- 0.73
Society	0.8	3.4	0.8	1.0	- 6.89	0.00	- 2.80
Economy	1.5	3.8	0.8	1.4	- 4.78	0.00	- 1.96

It is plain that the mean number of consequences given in the text was increased by the group facilitation technique in all three areas, probably evoked by a motivation increase effected by the facilitators.

Now we pose the question how independent raters evaluate the text protocols as an efficient means to get the problem of genetic engineering under control.

Table 3:
Mean rating of the mean quality-ratings (1: low – 5: high), N=12 groups. Each mean is based on the statement of 16 raters

Area	Mean		Standard deviation		t-value	p	Effect size
	Control	Exp.	Control	Exp.			
Ecology	2.38	3.29	1.01	1.33	- 1.91	< 0.05	- 0.75
Society	2.13	3.46	1.12	1.02	- 3.04	< 0.05	- 1.24
Economy	2.38	3.63	0.97	1.01	- 3.13	< 0.05	- 1.28

Starting from the a.m. postulates resulting from the experimental research of small groups it was possible to increase the quality of complex problem solving in project teams comprising different experts. And in addition, the number of high quality ideas increased.

Experiment 2: Controlling an Epidemic in a large City (Witte & Sack 1999)[1]

Method

Participants and Design

The sample comprised 193 female and 131 male students (average age = 27) from the Social Sciences and Economics departments of three north German universities. The subjects received a payment of around $25 for participation in a 3-member task-group which met twice for meetings of equal length (separated by one week) for a total of five hours.

The experimental design is described as follows:

1. The communication modality varies depending on whether group members work in the same room (coactive) or in separate rooms (separated).
2. Furthermore the communication modality varies depending on whether they communicate in oral or in written form.

[1] This material is based on work supported by the ‚Deutsche Forschungsgemeinschaft' (Wi557/12-1,2)

3. The control cells were given no guidelines on how to organize their work.
4. The first experimental groups were guided by the nominal group technique under the supervision of one facilitator.
5. The second experimental groups worked under ProMod conditions: one facilitator for each group member with no opportunity to communicate except in written form or by allowing the facilitators to pass on the information orally.

This stipulates a 3x2x2-factor design (Collaborative procedure, communication modality, and co-activity):

Table 4:
Experimental design "Controlling an Epidemic in a large City"

	Control		Nominal group technique		ProMod	
coactive	oral	written	oral	written	oral	written
separated	oral[1]	written	oral[1]	written	oral[1]	written

[1] In the separated oral conditions mobile phones were used.

Experimental Task

The complexity of this computer simulated task represents the complexity underlying most real life problems which arise where an 'eigendynamic' or idiosyncratic dynamism is experienced among a large number of connected variables (Funke 1992) which often remain unknown or ambiguous and therefore can be accessed in a multitude of ways (Frensch & Funke 1995). Accordingly creativity researchers (Getzels, 1982) highlight the important role of the ability to determine a problem as well as to find an appropriate solution. The used computer simulation program, Vaids, developed by Doerner and colleagues (Doerner, Schaub & Badke-Schaub 1990) simulates the development of an epidemic in a city according to interventions proposed by the group members taking part in this study. It offers a nearly unlimited number of potential parameters and interventions possible in such a simulation.

Procedure

The simulation represents a period of 17 years. The 'committee'-members are informed that

- All information about the state of the city at any time of the procedure must be explicitly requested from the bureaucracy.
- Only precisely formulated suggestions and questions can be translated into action as the bureaucracy refuses to guess what a suggestion may mean and skips those that are badly worded.
- After one hour the group-members obtain feedback with regard to the success of their interventions and are given answers to their questions.

Under the genuine PROMOD-condition (separated and written modality) subjects were directed to first think out and put down their ideas in line with the following steps:

- description of the current and the desired state of the situation,
- intervention in order to reach the desired state of the situation,
- visualisation by index cards on a flip chart and answers to questions put by the facilitator to increase the number and clarity of the formulations,
- facilitated reworking of individual 'solution maps',
- rotating the 'solution maps' by writing and commentating on the maps of colleagues,
- optimizing their own maps,
- the maps were exchanged once more,
- voting by secret ballot on the optimal common suggestion.

(Under the condition of 'separated oral conditions' either mobile phones were used or information was orally transmitted by the facilitators.)

Results

Data analysis reported here was carried out by means of simple ANOVAs. Simulation performance measure: The program reveals value parameters which describe the state of the epidemic (i.e. infected, sick or dead people). We took these three parameters in order to evaluate the last simulation performance measures (SIM).

Table 5:
Three factor ANOVA results (3x2x2-factor design) for simulation performance measures (SIM)

	F	df	p	power	eta^2
collaboration main forms	34.51	2	.00	1.00	.42
communication	2.75	1	.10	.38	.03
co-activity	.20	1	.65	.05	.00
collaboration x communication	.79	2	.46	.18	.02
collaboration x co-activity	.81	2	.45	.18	.02
co-activity x communication	.21	1	.65	.05	.00
collaboration x co-activity x communication	.03	2	.65	.06	.00

Note: Analysis made on N = 12 x 9 = 108 groups

Post hoc comparisons (Scheffé test) reveal that the PROMOD groups are the best in toto, and that they are significantly better than both control groups and better than the Nominal group technique (NGT) facilitated groups under written communication. A comparison of the 12 empirical cells and random results reveals that all PROMOD groups and the written groups under NGT facilitated groups were better than all other results. Somewhat dismaying is the fact that all of the control groups and the orally communicating NGT groups obtain performance levels which are, in principle, no better than when the program runs with randomly chosen interventions. The random program runs serve to find a baseline from which to evaluate the performance qualities of empirical groups. In a complex "discovered-problem" type task, a task-group without a rational strategy would appear to be lost.

Experiment 3: 'About the Desert-Survival-Problem[2]

Method

Participants and Design

The subjects of the group setting comprised 270 people: students of the University of Hamburg belonging to various faculties: Social Sciences, Economics and Law, students of the 'Bundeswehr' (German armed forces), policemen in further education and adults attending various schools. The group composition was identical

[2] This material is based on work supported by the ‚Deutsche Forschungsgemeinschaft' (Wi557/12-4)

with regard to subjects of different courses of study. The average age of the random sample was 24. The subjects received a remuneration of $10.

The communication modality varied depending on whether groups of 3 members worked under PROMOD instructions or under no-PROMOD instructions (control group)[3].

Furthermore 'synthetic groups' were built: The results of three subjects working individually at task-solving were combined at random. The arithmetic mean of the individual results served as the group performance result. The communication modality varied depending on whether the individually working subjects had no guidance through any facilitation technique or whether they worked under individual PROMOD instructions.

Table 6:
Experimental design "About the Desert Survival Problem"

	real groups	synthetic groups
no PROMOD-technique applied	27 groups	18 groups*
PROMOD-technique applied	27 groups	27 groups

*Note: For comparison the individual conditions, used to create a synthetic group result, were matched with the real groups conditions. A group facilitation technique could not be applied for individual performance; therefore the third "real group condition" could not be transferred to the individual work condition (see footnote 3).

Experimental Task

The Desert Survival Problem (Lafferty & Pond 1974) is a non-Heureka problem solving task. Several given objects have to be rank-ordered with regard to their usefulness in order to survive in a precarious situation. The quality of the results is expressed by the deviation from an expert conclusion about the rank order. As rank-order tasks are highly structured per se, groups working without any facilitation technique already show quite good results, which means that the quality of the result corresponds with the level of the second best group-member (Hollingshead 1996). In

[3] The "no PROMOD condition" varies in the following way:

a. no task structure; not guided by any group facilitation technique (9 groups) (m=59,89; s = 9,70)
b. task structure, not guided by any group facilitation technique(9 groups) (m=63,11; s=10,80)
c. task structure, guided by a facilitator ensuring the compliance of the task structure (9 groups) (m=62,78; s=8,90)

No significant difference between these three settings was noticed.

contrast to the tasks used in experiment one and two (technology assessment and prevention of an epidemic) an increase in the number of ‘ideas’ or interventions does not increase the quality of the decisions made; instead group members must discern the best suggestions and best arguments submitted.

Measures and Procedure

The group performance measure is expressed in the absolute difference between the group ranking and an expert rank-order. The maximal amount of deviation points (errors) is 112. Should the group fail to produce a consensual result and in order to get a ‘synthetic’ group the arithmetic mean of the individual points is used as the group performance measure?

$$\text{Group performance} = \text{‘error points’} = \sum_{1}^{15} (\text{group rating} - \text{expert rating})$$

The participants worked 50 minutes on the task at maximum.

Results

Data analyses reported here were carried out be means of ANOVA:

Table 7:
Two factor ANOVA results (‘2x2’ factor design without repeated measures) for quality of group performance

	F	df	p	eta^2
Corrected model	7.079	3	.00	.183
real/synthetic groups	4.066	1	.05	.041
PROMOD-facilitated/ not PROMOD facilitated	14.013	1	.00	.129
real/synthetic groups x PROMOD-facilitated/ not PROMOD facilitated	2.407	1	.12	.025

Note: analysis made on N = 99 groups

Post hoc comparison (Duncan test) reveals that PROMOD facilitated real groups are the best in toto and significantly better than the PROMOD facilitated synthetic groups and groups which were not guided by this facilitation technique.

Table 8:
Means of 'error points': quality of performance

	real groups		synthetic groups	
	means of 'error points'	std. deviation	means of 'error points'	std. deviation
no PROMOD-technique applied	61.93	9.56	62.83	6.62
PROMOD-technique applied	51.59	11.24	58.56	9.36

In general, the quality of performance when groups work on highly structured tasks corresponds with the level of the second best group-member (Hollingshead 1996). It is also known that individually worked out results, combined at random and transformed into a 'synthetic' group outcome by computing the arithmetic mean of the single performance results are similar to the level of the second best member of a 'natural' group concerning the quality of performance. Dismaying but not unexpected is the fact that the results of self-guided groups hardly differ from those of synthetic groups under the condition no facilitation technique is applied. In contrast, under PROMOD-condition group-members not only show better individual performance but also profit from the knowledge of their colleagues. This was proved by comparing those results with the results of synthetic groups under PROMOD-condition: There is an increase in individual performance and the latter groups additionally show an increase with regard to the quality of group performance in general. This is obviously due to a highly structured reception of other persons' knowledge and thereby to the increased ability to adapt this knowledge to enhance the quality of their own decision process. This second step of quality improvement when taking decisions in groups - beyond a pure enhancement of individual performance quality - can be induced by the group facilitation technique PROMOD. Both steps enable an improvement of group performances.

Discussion

The theoretical development of the group facilitation technique PROMOD has been presented. Three different empirical studies demonstrated its efficiency and effectiveness in improving group performance quality and enhancing group decisions. PROMOD stems from theoretical postulates that regard project teams as aim-oriented information processors. Clarifying theoretical concepts first and then following this by verifying empirical research is a necessary precondition in order to create efficient group facilitation techniques. A ‘trial and error’ process of introducing group techniques on ‘impressions’ gained only by observation results is a ‘naive-psychological assumption science’. This is not an adequate way to treat social requests which are addressed to the social scientific community. This study aims to be able to give an answer to the following question: Are basic research and theoretical assumptions a potential guideline for developing an efficient social facilitation technique for project teams? The results of the three presented experiments show that this question can be answered in the affirmative. We know that today’s problems are so complex that we need the cooperation and interaction of experts. We also know that the performance of project-groups is not as good as it could be when considering the specialized knowledge available in those groups. This expertise is not sufficiently used, thus, group results have so far been unsatisfactory. A diametrical strategy of theory testing and empirical application of theory enables the prediction of effects, and therefore enables the induction of positive effects and the prevention of negative effects on group interaction.

Looking at empirical results, it becomes clear that a lot of techniques are not very convincing, e.g. group brainstorming (Stroebe & Diehl 1994; Nijstad, Stroebe & Lodewijkx, 2003). What are the postulates behind those techniques which would enable the prediction of effects? Even if postulates are elaborated from empirical research, wrong conclusions often lead to disturbing influences and false effect predictions. Of course, there are more factors than the postulates presented here that could be regarded as principal candidates for the enhancement of group productivity.

Let’s have a look at a new study showing that groups are able to perform better than the best individual of the group – without any facilitation technique - (Laughlin, Bonner & Miner 2002). This study shows that a good group discussion result depends on the demonstrability of right solutions and ideas. The task involved was divided into several subtasks which were tackled by the group. The question is how to increase the demonstrability of arguments, suggestions and ideas and how to divide problem-solving tasks in a practicable and appropriate way in general, so that sub-tasks can be tackled or solved individually. The crux of an efficient group facilitation technique is to make an appropriate structure available to the group members discussing a certain subject.

Input and Output of information in groups are variables which determine group efficiency. In future throughput processes will have to be focused on in a more suitable way. Throughput processes can be supported by facilitation techniques, which have to be developed by first formulating theoretical postulates and then summarizing the results of empirical research.

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