EXPLORING GROUP WORK DYNAMICS

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Most construction courses create opportunities for social experiences; indeed, group work and vocational education are almost synonymous. Group tasks are given to students so that they can develop their task based knowledge and explore interpersonal skills. Unfortunately, the benefits gained from group work can appear so self evident that exercises are often undertaken without proper consideration for the behaviours that manifest. To explore the potential of the group it is important for the students and facilitators to have an awareness of the dynamics that are at play. Consideration should be given to the advantages that can be embraced by working as part of a group, independently and in isolation. A number of exercises have been used to help construction and project management students appreciate the production dynamics associated with individual and group work. The focus of this paper is on simple group and individual 'brainstorming' tasks that were used to help students to recognise some of the dynamics that affect the production of information in groups. Results from the group tasks and reflections from those participating were gathered and are presented. By expressing and exploring some of the thoughts and feelings experienced during such exercises a better understanding of group behaviour can develop.

Keywords: behaviours, group dynamics, group work, learning tool.

INTRODUCTION

Almost every construction course or training session uses group work as a part of the educational experience; indeed it is taken that groups and team are fundamental to the construction. The use of group work in vocational education and training is considered important to prepare students for the 'real' world. However, little thought is given to how we function in a group, the types of behaviour that manifest and whether the group process is beneficial to task being undertaken. With the exception of workshops that use Belbin's (1981; 1993; 2000) self analysis exercises few tools are used to help to understand group behaviour. If students are to be properly prepared for group work, classroom and workshops exercises need to be developed to encourage greater awareness of the group dynamics and how members can be managed to increase benefits and limit the weakness. Knowing what groups can do and where working in isolation would produce better results is also important. Earlier work into this area (Gorse 2002; Emmitt and Gorse 2006, Gorse *et al.* 2006a, 2006b) has taken some small steps forward exposing a number of issues associated with group dynamics and group member behaviour. However, there is much to explore and understand and, from a construction management perspective, there is so much that can be managed to make groups more effective.

GROUP DYNAMICS

Group work can be fun, stimulate creativity, help people relax, improve moral, and create relationships and bonds that would otherwise not develop. Some people are comfortable and enjoy listening and communicating in the small group settings. The

feeling of being part of a group can be a satisfying experience if the group is effective; however, group work can invoke fear, generate boredom and make people dissatisfied and annoyed. Indeed, some people are reluctant to take part or engage in group interaction (McCroskey 1997). Working in groups is synonymous with construction and there is a need to develop students so that they can work effectively in group contexts. Students and practitioners with good social skills who enjoy being part of a group can hone their skills while others with relevant construction knowledge that fear the group setting need to develop their skills. There are benefits and barriers associated with group work, which should be exposed and worked with so that students have a greater understanding of groups, how they operate and can engage in and manage the group environment.

GROUP WORK AS A LEARNING TOOL

Placing individuals within a team can either reduce or increase their potential. Due to the dynamics of the group, it is difficult to imagine a situation where group behaviour does not affect the individual. Before thrusting students into groups consideration should be given to the purpose of the work and the benefits that will be gained from the experience. While undertaking group exercises students can study the dynamics and reflect on their experiences within the group. Using group work as a learning tool is a good way of helping students to recognize characteristics and behaviours that manifest. And, to help explore the benefits gained through group work it is also worth considering the strengths of working individually and even in isolation. By developing training that makes use of tasks undertaken as part of a group and students working in isolation the potential benefits and dynamics can be explored.

Some, such as Sutton (2006), have suggested that comparisons between group and individual work are often pointless as the two situations are so different. Indeed, the two situations and dynamics are very different, yet it is still important to know and expose the differences in order that students can appreciate the benefits of alternative ways of working. The development of student awareness of group and interpersonal dynamics is an important part of understanding teamwork. Tasks can be designed to help students engage in and reflect on, and learn, from the group experience. However, before developing the task, the features and dynamics of the group that are to be explored must be considered.

DEVELOPING IDEAS IN A GROUP

It is good to encourage thought about the group process and the way information is exchanged and ideas are developed. There are a number of obvious features of group interaction that affect the exchange of information. With the exception of talking over another member, only one person can speak at a time. Turn-taking within groups affects individual contribution; as groups increase in size the average contribution of the individual reduces. The ability of an individual to interact is affected by the behaviour of other members. Groups, more often than not, have dominant individuals (Emmitt and Gorse 2006). Generally, group interaction, almost regardless of size is dominated by two or three members (Napier and Gershenfeld 1989; Gorse 2002); however, skewed interaction does not necessarily mean that a group is inefficient. Studies by Littlepage and Silbiger (1992) found that most groups were able to recognise expertise within the group and used it where appropriate, thus interaction became skewed to those individuals with relevant knowledge. However, some individuals are more socially gifted than others but may not have the knowledge to

support their level of input. Where individuals dominate interaction resulting in the exclusion of those with relevant information, the potential knowledge pool of the group is reduced. When making informed group decisions contributions should be relatively proportionate to the relevant knowledge that individual group member's have to offer (Emmitt and Gorse 2003). In order that students and construction professionals can engage and add their information to the group's pool of knowledge, group interaction skills need to be developed. In addition to this, ways of managing groups need to be exposed so that there is always the opportunity to gain relevant information from individuals.

Some members have the ability to interrupt, gain the floor, hold others attention and make their point, while others make minimal contributions. Such aspects of group behaviour have been termed 'production blocking'. In large groups members may spend so much time waiting for others to make their contribution only to find that they never gain an opportunity to contribute. Some members simply forget their idea whilst waiting their turn. A general dip in group performance can be experienced as members become overly focused on minor issues or personal agendas stuck in what has been described as the 'entrenchment' phase (Dainty *et al.* 2006). Bell (2001) and Gorse's (2002) study of workgroups suggests that group interaction is unevenly skewed and some members play a minimal role, being reluctant to participate, while others dominate interaction. Depending on the nature of the task, skewed interaction can adversely affect the group productivity, especially when those with relevant knowledge are blocked or suppressed.

Although it is inevitable that some individuals will talk more than others, the nature and size of the group can help to control participation. Communication scholars suggest that the group should be just large enough to deal with the task, the principle of least group size (Hare 1976). While some suggest that groups should not be below five members (Slater 1958) and others suggest that the optimum size of the group is six (Bales 1958; Hackman and Vidmar 1970), clearly such issues are dependent on what the function of the group is. If the function of the group is to get two people talking a two or three person group may be the most effective. One aspect of the student exercise reported here is to expose the strengths and weaknesses of different group demographics and to explore how size affects a specific performance.

GROUP WORK V'S WORKING IN ISOLATION

Group work is often used where the required output is better served by members working in isolation. Some tasks can be completed more effectively by individuals. Using groups simply to produced lists of ideas is often less effective than asking the same number of individuals to write down their thoughts on their own. Brainstorming in groups produces less ideas than that produced by the equivalent number of individuals working in isolation and then bringing those ideas together (Brown 2000). Furthermore, it has been suggested that the quality of information produced is better if people are given time to work alone generating their thoughts then bringing their ideas to the group for discussion, and if necessary evaluation (Fryer *et al.* 2004).

However, working in groups is not just about producing ideas. Indeed, a single idea may not have been possible without the potential for building on another person's suggestion. In multidisciplinary groups tasks are often impossible without the contribution of a number of specialists with their relevant expertise. Working with others allows people to gain knowledge, experience alternative views and beliefs.

People interact, argue and interrupt differently, and the time spent in groups helps members to confront, appreciate and accommodate such differences. Becoming aware and working with different behaviours helps develop interpersonal skills. Communication is often reciprocal, and the response to initial interaction has similarities and links to the message received. The style and behaviour initiated may be different to that normally used by the recipient. Recipients often adjust their behaviour to suit the initial communication (Gorse 2002). Thus, as different communication styles are introduced and used members may widen their range of communication acts and styles in order to respond accordingly or appropriately. Such events help develop a broader repertoire of communication styles and acts, especially for those actively engaging in the group discussion.

Group work helps to facilitate and develop interpersonal skills. But, to stretch those skills further it is often necessary to work with students to make them aware of their behaviour. For example, those who dominate may not be aware that their contributions suppress others, the use of video recording of groups and self observation is an effective way of enabling individuals to recognize how their behaviour affects others (Gorse and Whitehead 2002). Introducing turn-taking rules can be used to ensure each member of the group contributes. Those reluctant to contribute may experience initial problems when being forced to contribute; however, those who are more socially gifted, and may have previously dominated interaction can be encouraged to use their turns to briefly put forward their point and help others to engage. Under controlled and comfortable conditions and with the emphasis on developing a more evenly balanced distribution, those previously reluctant contributors can be encouraged to contribute. Unfortunately, with reluctant communicators being helped, the more evenly distributed participation tends to be less productive and slower than group interaction which flows naturally and is dominated by those with greater social confidence. However, with assistance, confidence to engage in groups can be improved and, over time, interaction skills can be developed so that natural group structure can resume.

RESEARCH METHOD

An exercise was undertaken to expose students to some of the dynamics associated with group work. A simple idea generating (brainstorming) task was devised. Students were asked to list factors that help and hinder small group decision making. Each group was given 15 minutes to complete the task. Two groups of six students were asked to do this as a group, to organize themselves and produce a single list of ideas. Twelve students were asked to produce the list independently in isolation and given the same period of time to complete the task as the groups. Once completed, the individual students who performed the task in isolation were brought together into two nominal groups of six where their ideas were gathered and aggregated together to produce two lists. Where different individuals listed identical ideas they were only counted once. Two other groups were given directions to control their group interaction and behaviour. One group used turn-taking cards which ensured each person had to contribute and no one individual could dominate. Another group listed an idea and then passed it to another member, enabling each member to be exposed to other ideas, which they in turn could build on or generate their own idea. Each member of the group worked on their ideas simultaneously so that six ideas could be produced at any one time.

The four different approaches to the same task introduced different group dynamics. By identifying the quantity of ideas produced by each group the overall task productivity could be explored. The number of ideas listed by the students were counted and then the totals for all of the groups were presented to promote discussion. Following the experiment students discussed the benefits and barriers associated with each of the approaches to the problem.

RESULTS

Although the results are for last years experiment, the workshop has been performed on 7 consecutive years. During this period, those working in isolation and then collating their ideas produced always produced more suggestions and ideas than the groups, which contained the equivalent number of students. The individuals produced lists separately, working in silence and then combined the results only excluding items which were identified as identical. The groups that had conditions imposed, such as turn-taking and information building produced less ideas than those working in isolation and tended to be less productive than those that interacted naturally. A sample of the results taken from this year's experiment is shown in Table 1.

Table 1: Brainstorming and idea generating results

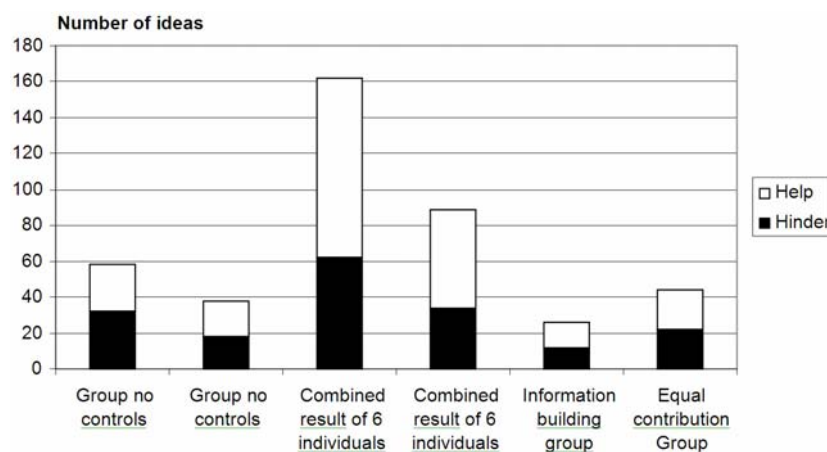| Number of ideas generated when working under different conditions						
	Group no controls	Group no controls	Nominal group	Nominal group	Information building group	Equal contribution Group
Number of factors identified that help and hinder group performance	Group of 6 working as members of a team collectively generating idea	Group of 6 working as members of a team collectively generating idea	Collection of results from 6 individuals working in isolation	Collection of results from 6 individuals working in isolation	Group of 6 students with specific instructions to exchange ideas in writing, which could be built on	Group of 6 whose participation was controlled so that no individual could dominate or avoid contribution
Hinder	32	18	62	34	12	22
Help	26	20	100	55	14	22
Total	*58*	*38*	*162*	*89*	*26*	*44*

Figure 1: Number of ideas generated by groups working under different conditions.

REFLECTIONS

In no specific order or rank a sample of ideas collected from the student discussion were collected and have been summarized below.

When working alone individuals are able to write down more ideas than they would if they attempted to contribute to a group; however, in groups ideas are generated as a result of others suggestions.

People forget ideas, encounter problems of boredom, may not enjoy the group experience, can become dissatisfied with the group if it is felt that contributions are not equal, and they are often not equal.

Is it a problem if individuals 'tune out' for a minute to gather their thoughts, they may miss important information. Despite instructions not to criticize ideas individuals may still be apprehensive about making a contribution, for fear of criticism, evaluation or simply feeling stupid. When not actively engaging in discussion, but wanting to make a contribution, individuals introduce self censorship, considering the potential impact of what they could say before saying it.

Some individuals have social inhibitions, when managing groups allowances should be made for this.

There are social implications of having an idea, a potentially obscure idea, and having it evaluated in public.

People do and need to introduce a level of self censorship, otherwise they would be viewed as stupid.

Members can experience pressure of knowing their turn is coming. A slow speaker or a person who takes their time to contribute may reduce the productivity of the group. Members may become irritated with waiting.

Group membership causes individuals to behave differently. Collective behaviour of a group can be more explicit and exaggerated than would be expected from individuals. Group brainstorming can build group cohesiveness and increase motivation; this may improve overall group performance, but would not necessarily be recognised in raw productivity figures, such as counting the number of ideas generated from a discussion.

Group processes can inhibit idea generation rather than stimulate ideas.

The initial verbalization of an idea may take time, some discussion and debate to formulate into a comprehensive suggestion. When an idea is put forward it is good to discuss it rather than immediately reject the contribution.

In some situations groups are inefficient, especially if an individual is capable of identifying solutions, rejecting errors, recognizing and adopting correct answers. However, multifunction groups can undertake task that an individual cannot.

Group members may be able to access the ideas of others that can in turn stimulate new ideas.

Group discussions can 'de-rail' a chain of thought, interfere with a member's ability to think. It may be useful to have time within group work for 'silent idea generation', when all members can simultaneously write their ideas down before any comments are made.

Controlling groups and participation can help individuals contribute and may also develop the interaction skills of those who are skilled interactors. It is inevitably that the time allowed for those members who are not eager to interact or as eloquent with their delivery will reduce the number and speed with which ideas are put forward and evaluated. Where members are forced to take a turn, the pressure placed on an individual to contribute can exacerbate the level of fear. Knowing that a contribution is expected can increase the level of apprehension. However, those who are socially skilled can encourage and help others, making participation a more comfortable experience.

In groups individual members tend to address specific individuals more than others, as certain members dominate interaction they also control who is addressed and actively involved in the group discussion. There can be a type of cooperative hierarchy structure even within small groups.

Electronic brainstorming, brainwriting and blogging may reduce some of the problems associated with face–to–face group work.

Social loafing is often considered to be a problem of group work. Unsupervised sessions can result in some members not taking part in the work. When not observed some students refuse to work, make and accept phone calls and send text messages. Some students are easily distracted in group work.

DISCUSSION

Brainstorming is a simple idea generating technique, involving participants trying to think up as many solutions as possible to a particular problem. The ideas should be generated freely with no criticism, there should be no attempt to evaluate or question the idea, yet even when given this instruction the groups did evaluate, and even introduce self censorship, not always suggesting all of the ideas they thought up. In groups individuals have to wait their turn to make a contribution, some individuals are dominant and some reluctant to contribute to the group discussion (Emmitt and Gorse 2003; 2006). The group brainstorming concept is often used at the start of problem solving to come up with the broadest spectrum of options; however, the results from

this small study, suggest that it may be better if individuals work in isolation, generating as many ideas as possible before bringing them into the group situation.

The most common way of brainstorming ideas is in groups; generally people believing that the group would produce better ideas than individuals. However, this study and previous research has shown that the individual will produce more ideas on their own than they would in a group (Brown, 2000). Though a group would generate more ideas than an individual, when the ideas of those working as individuals are combined with other individuals, making the same number of contributors as the group and removing identical ideas, the nominal group made up of individuals out performs the real group. Groups of individuals out performs *bone fide* group by 2:1, this supports previous research (Taylor, Berry, and Block 1958). Such results suggests that brainstorming should be first carried out in private, with the group meeting being used to evaluate the ideas which have been generated by the individual (Lamm and Trommsdorff, 1973).

The simple exercise provides results that can challenge students' perspectives, the exercise always results in energetic and informative debate. Since the introduction of the term brainstorming (Osborn 1957) there has been much critical discussion surrounding the use of the technique (Diehl and Stroeve 1987; Mullen and Johnson 1991;Laughlin *et al.* 2003; Nihstand and Strebe 2004; Nijstand *et al.* 2004; Paulus 2006). Conducting such experiments with students results in good debate, exposing pertinent issues. The discussion encouraging greater awareness of the dynamics associated with group work. Quite rightly, the students are always eager to inform others of the benefit of the group experience, the limitations of the experiment and the fact that the results are only one aspect of group performance and provide little information about group development, dynamics and behaviour. Such exercises are easy to introduce alongside standard group tasks. If the exercises are done early on in the group work, the groups generally give much more consideration to how they should manage themselves in group situations.

It is clear that groups are fundamental to construction and, when possible, in comfortable environments, students can be exposed and introduced into groups. It is important to give the students the time to explore group behaviour and productivity.

While giving a group direction may help improve performance, Kirkpatrick's (2005) study of student group work found that although lecturer intervention and guidance resulted in improved grades and greater student satisfaction, it had an adverse affect on group cohesion. Although initially concerned about the degree of 'nonsense' that students discuss in group situations, Kirkpatrick concluded that the unstructured 'chat' component of groups is important because it often forms the start of more productive interaction between members. Interestingly, Lee (1997) noted that professionals often used informal environments to 'strike up' general conversations. Such informal interaction would often lead onto the discussion of a work related topic. The use of chat, small talk and other unstructured and informal interaction can be important when establishing an environment where other issues can eventually be introduced.

To ensure that individuals are given time for uninterrupted thought, to engage in informally and socialize, to contribute to groups, building on others information and to learn from the experience, much consideration must be given to the task design. Exposing and exploring the dynamics of working in isolation and as part of an unstructured and structured group will require different parts, phases and stages to the exercise. Tutors as well as students learn from such group exercises and refining the

design of group work to take advantage of the characteristics discovered further increases understanding of this dynamic environment.

CONCLUSION

Group work and individual work are fundamentally different. People behave differently in groups and their thoughts, attitudes, beliefs are affected. Group interaction, can inspire, add creativity, provoke thought and manifest feelings that would not occur when working alone. Equally members can suppress, block and ignore members, again creating thoughts and feelings that would not occur when working alone. Group work can be scary, individuals may dread the thought of working with others, especially when the potentially detrimental dynamics of the group exercise are ignored by those facilitating the session. To help students recognize and work with interpersonal skills, situations can be created to allow people to experience the benefits and limitations of individual and group work. Conditions can be controlled, recorded and reflected on. Use of electronic media, turn-taking cards, equal participation controls, limiting individual contribution, monitoring and recording potential conflict and supportive behaviour can help develop interpersonal skills that would otherwise be missed in the group experience. Before using the group work consideration should be given to the aspect of group behaviour or the group process that is being used or developed.

Students should be encouraged to switch between solitary, individual and group work to develop creative and innovative thought processes. There are benefits to be gained from working individually and as part of group; however, it is import that students recognize the skills associated with groups and have tools and mechanisms at their disposal to help them gain advantage from the situation.

REFERENCES

Bales, R. F. (1958) Task roles and social roles in problem-solving groups. In: E.E. Maccoby, T. M. Newcomb, E.L. Hartley (Eds.) Readings in Social Psychology, 3rd Ed. Holt, New York. 437-447.

Belbin, R. M. (1981) Management Teams, Why They Succeed of Fail, London, Heinemann.

Belbin, R. M. (1993) Team Roles at Work. Oxford, Butterworth-Heinemann.

Belbin, R. M. (2000) Beyond the Team, London, Butterworth-Heineman.

Bell, L. (2001) Patterns of interaction in multidisciplinary child protection teams in New Jersey, Child Abuse and Neglect, 25, 65-80.

Brown, R. (2000) Group Process: Dynamics within and between groups, 2nd Ed. Oxford, Blackwell.

Dainty, A. Moore, D. and Murray, M. (2006) Communication in Construction: Theory and practice, London, Taylor and Francis.

Diehl, M. and Stroeve, W. (1987) Productivity loss in brainstorming groups. Towards the solution of a riddle. Journal of Personality and social psychology, 53 (3) 497-509.

Emmitt, S. and Gorse, C. A. (2003) Construction Communication, Blackwell Publishing, Oxford.

Emmitt, S. and Gorse, C. A. (2006) Communication in Construction Teams, London, Spons. .

Fryer, B. Egbu, C. Ellis, R. Gorse, C. A. (2004) The Practice of Construction Management, 3rd Ed. Oxford, Blackwell Science.

Gorse, C. A. (2002) Effective interpersonal communication and group interaction during construction management and design team meetings, Unpublished PhD. University of Leicester.

Gorse, C. McKinney, I. Shepherd, A. Morley, D. and D. Ellis, R. (2006 a) Internal support mechanisms in groups and teams, Proceedings of the Association of Researchers in Construction Management. 22nd Annual Conference, 4th-6th September, University of Central England. ARCOM. 925-934 .

Gorse, C., McKinney, I. Shepherd, A. and Whitehead, P. (2006 b) Meetings: Factors that affect group interaction and performance. Proceedings of the Association of Researchers in Construction Management. 22nd Annual Conference, 4th-6th September, University of Central England. ARCOM. 915-924.

Gorse, C. A. and Whitehead, P. (2002) The teaching, learning, experiencing and reflecting on the decision-making process. Khosrowshahi, F (Ed.) DMinUCE The 3rd International Conference on Decision Making in Urban and Civil Engineering, London 6th-8th November '2002 (CDRom).

Hackman, J. R. and Vidmar, N. (1970) Effects of size and task on group and member reactions. Sociometry, 33, 1 (March), 37-54.

Hare, A. P. (1976) Handbook of Small Group Research, 2nd Ed. The Free Press, New York.

Kirkpatrick, G. (2005) Online 'chat' facilities as pedagogic tools: a case study. Active Learning in Higher Education, 6 (2), July, 145-159.

Lamm, H. and Trommsdorff, G (1973) Group versus individual performance tasks requiring ideational proficiency: a review. European Journal of Social Psychology, 3, 361-388.

Laughlin, R.P. and Zander, L. M. Knieval, M. E. and Tan, K. T. (2003) Groups perform better than the best individuals on letters-to-numbers problems: Informative equations and effective strategies, Journal of Personality and social psychology. 85 (4) 684-694.

Lee, F. (1997) When the going gets tough, do the tough ask for help? Help seeking and power motivation in organizations. Organizational Behaviour and Human Decision Processes, 72 (3), December, 336- 363.

Littlepage, G.E. and Silbiger, H. (1992) Recognition of expertise in decision-making groups: Effects of group size and participation patterns. Small Group Research, 22, 344-355.

McCroskey, J. C (1997) Willingness to communication, communication apprehension, and self-perceived communication competence: conceptualizations and perspectives. In: J.A. Daly, J.C. McCroskey, J. Ayres, T. Hopf, D.M. Ayres. Avoiding communication: Shyness reticence, and communication apprehension, New Jersey, Hampton Press. 75-108.

Mullen, B. and Johnson, C. (1991) Productivity loss in brainstorming groups: A meta-analytic integration. Basic and Applied Social Psychology. 12 (1) 3 -23.

Myser, M (2006) When Brainstorming goes bad: Business 2, 7(9) 76.

Napier, R. and Gershenfeld, M. (1989) Groups: Theory and Experience, Dallas, Houghton Mifflin.

Nijstand, B. and Strebe, W. (2004) How the group effects the mind: A cognitive model of idea generation in groups. Personality and social psychology review, 10 (3) 186-213.

Nijstand, B. Vianen, A. Stroebe, W. and Lodewijkx (2004) Persistence in Brainstorming: Exploring Stop Rules in Same-Sex Groups. Group Processes and Intergroup relations. 7(3) 195-206.

Osborn, A. F. (1957) Applied imagination: Principles and procedures of creative problem solving. New York: Charles Scribner's Sons.

Paulus, P. B. (2006) Putting the brain back into brainstorming: Associations Now, 2 (12), 24-28.

Slater, R. E. (1958) Thinking ahead. Harvard Business Review, 36 (2), 27-39.

Sutton, R. I. (2006) The truth about Brainstorming. Business Week. No. 4002, September. 17-23.

Taylor, D. W., Berry, P.C. and Block, C.H. (1958) Does group participation when using brainstorming facilitate or inhibit creative thinking? Administrative Science Quarterly, 3, 23-47.