

GENERAL PRINCIPLES OF BRAINSTORMING

Rule 1. Considerably more ideas will be produced if critical judgment is entirely eliminated during the idea production process.

Rule 2. Group ideation can add to an individual's idea output.

Rule 3. The more ideas that can be created, the better the overall results.

PREPARATION FOR GROUP BRAINSTORMING

1. Group Chairman
2. Recorder.
3. 'Core' Members
4. Guests
5. Pre-conditioning. (30 minute intro)
6. Attendance of Top Management. (Don't invite them)
7. Size of Group. (About a dozen.)

HOW TO CONDUCT A BRAINSTORMING SESSION

(a) Preliminary procedures

1. Simplify the problem
2. Highlight the problem's background
3. Select and invite participants

(b) Group session procedure

4. State the basic rules -
 - **Judicial judgment of ideas is not allowed** - Criticism **MUST** be withheld until later
 - **'Free-Wheeling' is welcomed**
 - **Quantity of ideas is wanted**
 - **Combination and improvement are sought**
5. The Practice Session – (a 10 minute 'warm-up' session brainstorming some simple problem)
6. Brainstorming the problem
7. Recording the ideas produced - No idea should be identified with the participant responsible for suggesting it.
8. Terminating the session – (40 minutes is about optimum)
9. Post-session activities

- Sending typed minutes of each session to each participant, with plenty of blank space provided so that they can add further suggestions that have since occurred to them.

To: Mr. John Tagmarch,
Section Leader - Airframe Design Office.

You are invited to participate in a brainstorming session on Tuesday, May 14th at 3.00pm in the Staff Conference Room. The problem as stated by our Technical Director is : "What ways and means can you think up for removing ice from aircraft and helicopters that are parked in the open". Ice formation has been a peril and hindrance in the field of aviation not only to airborne aircraft, but in some regions even to aircraft that are parked in the open. In such regions, many aircraft have been rendered useless while awaiting a signal to repel an impending attack or to depart on a mission of mercy. So any ideas for new equipment or protective procedures will be appreciated.

Examples of the kind of ideas we are seeking are as follows :

1. Spray aircraft with liquid which will quickly dissolve ice.
2. Invent electrical apparatus shaped like a mattress which may be placed under aircraft to heat it, thus melting ice.
3. Invent ice extinguishers containing a gas which would react with ice to dissolve it.
4. Coat aircraft with ice resistant paint which would allow any ice that formed to be quickly chipped off.
5. Park aircraft over grids that allow heated air to be blown upwards and over total external surface of parked aircraft.
6. Put hot water bottles on aircraft to melt ice.

FRANK DOBSON
Brainstorm Panel Chairman

- Circulating a round-robin idea-folder to be passed to each participant within a definite time, and with instructions that new ideas are to be added in handwriting.

10. Evaluation of ideas

a. Criteria for evaluating ideas for a new product

1. Is the idea simple enough?
2. Is it compatible with human nature?
3. Is it timely?
4. Is it feasible?
5. Can it be duplicated by competition?
6. Is its application limited?
7. Is it costly to produce?
8. Is it safe? etc.

b. Check-list of criteria for ideas relating to improving the manufacture of a particular product.

1. Will it increase production - or improve quality?
2. Is it an improvement over the present tools and machinery?
3. Does it improve methods of operation, maintenance or construction?
4. Does it permit a more effective utilization of manpower?
5. Does it prevent waste or conserve materials?
6. Does it eliminate unnecessary work?
7. Does it improve present methods?
8. Does it reduce costs?
9. Will it improve working conditions?
10. Does it improve safety?
11. Does it improve labor relations?

11. The presentation of selected ideas - Having discarded all worthless ideas, the valuer then prepares, in order of merit, a short list of what he considers to be the ideas most likely to solve the problem satisfactorily, and which he is prepared to recommend to his management.

Brainstorming positively develops creative ideas

The formation of any business begins with someone producing the initial idea for the project. The continued success of an established business depends upon the number and quality of the ideas fed into it. Without a continual flow of new ideas, a business cannot function profitably or expand successfully and must, therefore eventually fade into total obscurity. Ideas for a new business project, a new product, a means of reducing manufacturing costs, or for solving industrial labor problems, begin in the human mind. Most people conceive their ideas unconsciously, and because they are unaware of the mental mechanics that caused the 'idea' to be produced, they cannot repeat the ideation process to produce further profitable ideas at will. Fortunately, there are available established creative techniques which, when used correctly, do enable a person to produce a large number of first-class ideas at will. One such creative technique, and probably the most widely used in American industry, is 'brainstorming'.

WHAT IS 'BRAINSTORMING'?

This unique technique is used for the deliberate production of a large number of ideas in the shortest possible time.

Developed some 28 years ago by Alex F Osborn, co-founder of one of America's most successful advertising agencies, 'brainstorming' originally referred only to deliberate ideation by groups. As a result of practical usage, modification and research, the term has evolved until now it refers to the basic principle of suspended judgment which scientific research has proved to be highly productive in individual creative effort as well as in group effort.

Deferred judgment functions on the basis of the deliberate alteration of normal thought processes. Instead of trying to think critically and imaginatively at one and the same time, the creative thinker uses his creative mind and his judicial mind separately. In other words judgment is not allowed to jam creative imagination.

To test this principle a group of ideators jointly brainstormed a particular problem while, simultaneously, an equal number of ideators individually attacked the same problem in the conventional way - but without deferring judgment. The results showed that, in the same amount of time, the groups which applied the deferred judgment principle produced 75 per cent more good ideas than did the groups who judged each idea separately before producing another.

GENERAL PRINCIPLES OF BRAINSTORMING

Although the detailed procedures used in applying the 'brainstorming' technique tend to vary in line with the special needs of the user, in almost all applications the following general rules apply when using the techniques.

Rule 1. Considerably more ideas will be produced if critical judgment is entirely eliminated during the idea production process.

Because education and experience have trained most people to think judicially (i.e. critically) rather than imaginatively, the flow of ideas they are capable of producing is impeded because they apply their critical evaluative faculties too soon. They are more concerned with assessing the value of individual ideas than with creating a large number of alternative ideas. By deferring judgment during the idea-producing process, however, alternative ideas can be produced for a longer period, and therefore, a considerably larger number of ideas are available for evaluation at the end of the ideation period.

Rule 2. Group ideation can add to an individual's idea output.

Usually a person's experience of joint thinking is gained from his attendance at the traditional kind of conference or lecture, where original ideas are neither asked for nor encouraged. The principal value of group brainstorming lies in the fact that a brainstorming session, when properly conducted, can produce far more good ideas than a conventional conference - and in much less time. A striking example of this can be instanced by a brainstorming session held by

the American Cyanamid Company which produced 92 ideas in a single 15 minute session - more than 6 ideas per minute, and an average of over 8 ideas per person attending the session. Group brainstorming procedures call for individual ideation both before and after each session. Since a combination of these two methods of approach to 'brainstorming' usually produces maximum results, an alternation between group ideation and individual ideation is recommended as the best means of obtaining really effective results.

Rule 3. The more ideas that can be created, the better the overall results.

Characteristic of brainstorming is the fact that by driving for a few more ideas, you get far more. Ideas create still more ideas. First you get 30 and you want to get 60. Then when you get 60 you want to get 75. Probably seven of those last 15 ideas are first rate, and would never have been conceived had the quantity of ideas required been, say, limited to only 30. The more suggestions produced during a brainstorming session, the greater the chances of producing first-class ideas.

PREPARATION FOR GROUP BRAINSTORMING

The size of a brainstorming group depends upon the extent and type of organization it is to serve. Ideally, the group should consist of a Chairman, a Recorder (otherwise known as the 'idea collector'), six regular 'core' members and about six guests. Certain qualification requirements govern the selection of a group's members, namely :

1. Group Chairman. The Group Chairman, or Leader, should be trained in advance of his function. Preferably he should have taken a course in creative thinking and have participated, as a group member, in various brainstorming sessions. He should NOT be a senior member of the organization's management.

2. Recorder. The only contribution required of the Recorder is that he or she be able to record all ideas quickly and reliably, and without interruption of the ideation proceedings. Often a tape-recorder can be used effectively for this function.

3. 'Core' Members. As the 'core' members are the group's pace-setters, they must be people who have repeatedly demonstrated their ability to produce original ideas or suggestions.

4. Guests. The guests should be invited from various departments of either the organization or its associate concerns. A different group of guests should be invited for each brainstorming session. This rotation helps to spread a creative spirit throughout an organization, and prevents the development of a rigid pattern of thinking, such as would occur if the same guests were invited to each and every session.

Often it is helpful to include among the chosen guests at least one, or possibly two, people who know nothing at all about the problem under discussion. People without experience in a particular field bring a new, often valuable viewpoint to the problem.

5. Pre-conditioning. Since guests who have never before participated in brainstorming sessions are unfamiliar with the various creative techniques involved, a relatively thorough orientation is recommended. Ideally, this should be accomplished in a 30 minute briefing lecture which covers the basic principles of ideation as well as brainstorming procedures.

6. Attendance of Top Management. Experience indicates that brainstorming sessions tend to be less productive when a high-ranking member of the organization's management is present. They tend by facial expression, or otherwise, to induce an inferiority complex on the part of the remaining members of the group, and thus discourage 'free-wheeling'.

7. Size of Group. Although larger sized groups have been used for brainstorming sessions, experience indicates that the optimum size of a group is about a dozen.

HOW TO CONDUCT A BRAINSTORMING SESSION

Essential to the success of any group brainstorming session is an atmosphere that will allow each member of the group to depart freely from his logical and conforming mental control, and to assume the framework established by the Group Chairman.

(a) Preliminary procedures

1. Simplify the problem - The first task of the Chairman in organizing a brainstorming session is to ensure that the problem to be brainstormed is presented in a manner best calculated to produce the largest number of alternative ideas. This he does by carefully examining the problem with the individual who submitted it. His objective is to ensure that the problem is stated simply and specifically. It should not be an all-encompassing problem, such as 'how to reduce manufacturing costs?' Such a problem must first be analyzed into its numerous, more specific sub-problems like 'Ideas for reducing material costs'; 'Ideas for reducing machinery costs'; 'Ideas for reducing drilling costs' etc., which may be more amenable to the brainstorming process.

2. Highlight the problem's background - Once a single specific problem has been selected and its definition agreed upon, the individual who submitted it must provide the informative background necessary to familiarize the group's participants with the problem. This he does by providing the material for a one-page memorandum, to be written by the group Chairman, which highlights the background of the problem, states the problem in its simplest terms, and gives at least two examples of the type of ideas which are sought (as shown opposite).

3. Select and invite participants - The Chairman then selects his group participants in the light of the nature of the problem to be solved. At least two days in advance of the session the participants are invited by telephone or otherwise and are simultaneously supplied with copies of the 'background' memorandum (such as that illustrated) so as to allow the participants to 'sleep on the problem' thus allowing incubation to enhance the working of free association of ideas.

Similarly, the Chairman should develop in advance his own list of possible solutions to the problem so that, if and when the session slows down or gets off track, he is in a position to reactivate the flow of ideas by contributing some of his own. The same objective can also be achieved by the Chairman introducing idea-spurring questions.

(b) Group session procedure

4. State the basic rules - Once the group is assembled the Chairman outlines the four basic rules to be adhered to throughout the session, namely :

- **Judicial judgment of ideas is not allowed** - Criticism of ideas produced **MUST** be withheld until later. (Someone, or another group, will evaluate the ideas later.)
- **'Free-Wheeling' is welcomed** - The wilder the idea, the better. It is easier to moderate than to produce.
- **Quantity of ideas is wanted** - The greater the number of ideas, the more likelihood of good ones.
- **Combination and improvement are sought** - In addition to contributing their own ideas, each member suggests how ideas contributed by others can be improved, or how two or more ideas could, with advantage, be combined.

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FRANK DOBSON
Brainstorm Panel Chairman

A large placard on the wall - positioned so that it can be easily seen by each member of the group - states these rules. In front of the Chairman is a handbell which he will ring whenever any member of the group violates a rule.

5. The Practice Session - Before seriously brainstorming the given problem, a 10 minute practice, or 'warm-up' session is provided. This exercise should consist of brainstorming some simple problem, such as: 'In what ways could office chairs be improved?'

6. Brainstorming the problem - At the end of 10 minutes the Chairman calls a halt to the practice session. He then repeats the rules of the session, presents the problem simply and then calls for suggestions in solution of the stated problem.

When several hands are raised simultaneously there is the danger that in absorbing ideas propounded, the later participants may forget their ideas. It is recommended, therefore that each member be provided with a scratch-pad so that he can jot down details of ideas he plans to offer when his turn comes.

Participants are not allowed to bring written ideas into the meeting. Only one idea should be offered at a time by any participant, otherwise the pace of the session will be impeded.

7. Recording the ideas produced - The job of the Recorder is to list every idea suggested during the brainstorm session. Ideas should not be taken down word for word, but briefly reported. The Recorder should be seated next to the Chairman so that he, or she, is in direct line of communication with him, as well as with the other members of the group.

Some firms tape-record their brainstorm sessions, thus enabling the Recorder to re-check the list of ideas which have been reported during the session.

Regardless of how the ideas are recorded, it is helpful to write a few on a black-board during the progress of the session in order to provide visual stimulation to the participants. This enables the Chairman to refer the group to these listed ideas in case of lulls, or to encourage idea-combinations by free-association of ideas.

Each idea recorded should be numbered so as to enable the Chairman to know how many ideas have been produced up to any point of time in the session. If he has previously decided upon a particular quota of ideas for the session, he is then able to know at any time how close he is to his target.

No idea should be identified with the participant responsible for suggesting it. Possibly, the very same idea may have been previously thought up by another participant. Or the idea may have resulted directly from an earlier suggestion made by someone else.

8. Terminating the session - Experience indicates that the optimum length for a group brainstorming session is about 40 minutes. If more time is needed, it is a good idea to break up the problem into smaller problems, each of which can be handled satisfactorily in a 40 minute session.

When closing the session the Chairman expresses his appreciation and requests the participants to keep the problem in their minds until the next day when they will be asked for their afterthoughts.

9. Post-session activities - The following day, the group's Recorder either sees or phones the participants to obtain from them any further suggestions they may have to offer.

Because each of the participants has 'slept' on the problem, some of the most valuable ideas are likely to be produced as a result of individual ideation pursuant to the session.

Many companies using brainstorming adopt a multiple program for gathering post-session ideas by :

- Sending typed minutes of each session to each participant, with plenty of blank space provided so that they can add further suggestions that have since occurred to them.
- Circulating a round-robin idea-folder to be passed to each participant within a definite time, and with instructions that new ideas are to be added in handwriting.

Once all ideas have been gathered from participants, the Recorder finally prepares a triple spaced typewritten list of all the ideas suggesting during the brainstorm session. Afterwards the group Chairman edits the list, making sure that each idea is correctly and properly described. He also classifies the ideas into logical categories. Under each classification he gives the numbers of the individual ideas (as taken from the original list) which should be included in that section. Once this task has been accomplished, the ideas accumulated are then ready for evaluation and final selection.

10. Evaluation of ideas - Evaluating the final selection of ideas is generally done by the individual responsible for submitting the problem that has been brainstormed. He selects those ideas which seem to be the most promising, at the same time seeking to develop more and better ideas by combining one idea with another, or a series of ideas, or by reprocessing the ideas through combination, elaboration or other creative means. Wary of rejecting apparently farfetched ideas too quickly, he considers the seemingly silliest idea from all possible viewpoints. As a result, the most unpracticable idea is often developed into a first-rate suggestion. To facilitate the evaluation of ideas, it is often helpful to create a check-list of the various criteria to which the required ideas should conform and so as to ensure that each idea is considered from various essential viewpoints. The following examples illustrate the (a) type of check-list that could be used to evaluate ideas for a new product and (b) that could be applied to ideas for improving the manufacture of a particular product.

a. Criteria for evaluating ideas for a new product

1. Is the idea simple enough?
2. Is it compatible with human nature?
3. Is it timely?
4. Is it feasible?
5. Can it be duplicated by competition?
6. Is its application limited?
7. Is it costly to produce?
8. Is it safe? etc.

b. Check-list of criteria for ideas relating to improving the manufacture of a particular product.

1. Will it increase production - or improve quality?
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9. Will it improve working conditions?
10. Does it improve safety?
11. Does it improve labor relations?

Pertinent criteria can be added to each check-list and as dictated by the nature of the ideas to be evaluated.

11. The presentation of selected ideas - Having discarded all worthless ideas, the valuer then prepares, in order of merit, a short list of what he considers to be the ideas most likely to solve the problem satisfactorily, and which he is prepared to recommend to his management.

