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KEYWORDS	Groups, Creativity, Brainstorming, Rural Society, Cognitive processes			
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ABSTRACT This brainstorming experiment assessed the extent to which idea exposure produced cognitive stimulation				

and social comparison effects. One hundred and forty nine students were exposed to either high or low number of common or unique idea in this regard. The results revealed that each group generated more than 90 ideas on an average within the given 30 min both quantitatively and qualitatively. Whereas, when the same number of students was asked to generate ideas individually, only three-fourth of idea was produced by them. This gives a clear picture that group learning always outperforms individual leaning in a classroom atmosphere. Coverage of high number of ideas in various aspects of rural society to common ideas based on their general thinking of society enhanced the generation of additional ideas. The exploratory study included in this paper also sheds light on the limitations of brainstorming.

### INTRODUCTION

Brainstorming as an individual or a group creativity technique is a popular method for generating creative ideas among students. Inducing such creative ideas in a learning environment is widely understood as an important stage or factor in models of imagination and innovation among student's community (Glynn, 1996; Shalley, Zhou and Oldham, 2004 & West, 2002). Although brainstorming technique was popularized by Alex Faickney Osborn in 1953, a great deal of research tested Osborn's claims about the effectiveness of group brainstorming and felt that brainstorming does not directly generate ideas (Parnes, 1963; Taylor, Berry & Block, 1958). In the present study also, an assessment was made with the nominal (inexperienced) group of 149 students of II B.Sc. Agriculture of Vanavarayar Institute of Agriculture, and were asked to generate ideas regarding the characteristics and functions of rural society. The results revealed that each group generated many ideas both quantitatively and qualitatively. Whereas, when the same number of students was asked to generate ideas individually, only three-fourth of idea was produced by them. This gives a clear picture that group learning always outperforms individual leaning in a classroom atmosphere. From the student's performance, factor which played the main role was found to be group discussion. Discussions cannot be made individually. It requires two or more person with whom ideas can be shared and ideas could be opposed or welcomed by each other.

Osborn (1957) argued that generating as many ideas as possible offers the best chance of generating creative ideas. This proposition has received support (Diehl & Stroebe, 1987, 1991), but there is also evidence of trade-off between quantity and creativity in organizational contexts (Sutton & Hargadon, 1996). Many questions remain about the types of actions teachers should take to create expectation for idea generation (Shalley et. al., 2004; Sutton & Hargadon, 1996; Tierney & Farmer, 2004; West, 2002). These questions reveal that expectations for creative ideas are often vague and complex. Observers may frequently agree on creative ideas after the fact (Amabile, 1996), but designing successful interventions to improve idea generation requires a more precise tailoring of our expectations in advance. Most brainstorming research has focused on social factors in the productivity gap between nominal group and individual. However, researchers have recently begun to investigate cognitive factors as well, in particular the extent to which idea exchange influences idea generation (Dugosh, Paulus, Roland & Yang, 2000; Nijstad, 2003). Having known these entire outcomes from various researches, I proposed a theme based view of intervention to accomplish this tailoring.

I started the session by outlining a foundation class for students on ways to generate ideas. I then briefly discussed the need for such a technique in a class room atmosphere that considers brainstorming as an intervention and suggested a theme as a bridge between the brainstorming and the student's creativity literature. During the class, students were taught about Osborn's four rules for brainstorming session,

Judgment of ideas is not allowed: When a student is actively involved in generating ideas, judgments should not be made at that point. This may deter his/her creativity. This rule comes on the later part once after conveying his/her ideas generated in the group.

**Outlandish ideas are encouraged:** To get a good and long list of ideas, unusual ideas are welcomed. They can be generated by looking from new perspectives and suspending assumptions. These new ways of thinking may provide better solution.

A large quantity of ideas is preferred: This rule means of enhancing divergent production, aiming to facilitate problem solving through the maxim quantity breeds quality. The assumption is that, the greater the number of ideas generated, the greater the chance of producing a radical and effective solution.

**Group members should suggest idea improvement:** Good ideas may be combined to form a single better good idea as suggested by saying "1+1=3". It is believed to stimulate the building of ideas by the process of association.

After that, I conducted a brainstorming session as group as-

signment to analyse how existing research supports the conceptualization of the four rules of brainstorming.

# METHOD

# Participants

One hundred and forty nine students from second year B.Sc., Agriculture participated to fulfill a course requirement. They were assigned three conditions (Group, Memory group and nominal). Participants were recruited in groups of twelve. All the groups were asked to perform nominal group technique.

## Materials

Each participant was asked to write their ideas anonymously. In the group condition, each group was given two sheets of paper on an average. For the individual writing condition, each participant was given a single sheet. A general theme was put forward to them "understanding the characteristics and function of rural society". I found some students could not able to understand the theme. Hence I elaborated them like saying "if you happen to visit a village in order to collect data from a farmer, what are the possible data you can acquire from him regarding his farming and village.

# FINDINGS AND DISCUSSION

When students arrived for the session, I being a teacher of Rural Sociology and Educational Psychology to them explained the four brain storming rules and procedure. In the first session participants were given 30 min to generate possible ideas in the sheets. Each group consisted of 10 students and was asked to generate as much as ideas in the paper through group discussion within the given time. When they conclude with a completed slip, there were to surrender the slip to the facilitator (i.e.) me. At the end of session, it was found that each group may able to generate as much as 90 ideas on an average.

To know which ideas suits most for the present theme, group votes on each ideas was made. The voting method was simple as a show of hands in favor of a given idea. This process is called distillation (i.e.) filtering out irrelevant ideas for the present theme. After distillation, it was found that 60 ideas on an average from each group was top ranked by the participants themselves. From this it was concluded that, brainstorming definitely played a role in inducing creativity among students and the factor that played a major role here was discussion. From this I found that, discussing deeply on an issue may lead to enormous generation of ideas. Since the theme is not focusing on the problem identification of a village, student could able to generate ideas that would favor their study on the social institutions, social mobility, social groups, social values and standard of living. If the theme was on identification of problem and problem solving, then students might have generated ideas accordingly. Even in this aspect, it is believed that brainstorming would have been a key in making the student identify a problem by means of assumption and also would have provided a solution to solve it. It is all the thinking that makes a student act creatively.

"The creative process does not end with an idea; it only starts with an idea." - John Arnold

Creative and productive thinking are stated goals of most programs designed for the gifted and talented (Feldhusen & Treffinger, 1985; Gowan, Khatena & Torrance, 1979). Creative learning and creative problem solving are well established programming areas for those who provide differentiated as well as regular classroom instruction (Cosa 2001; McGrane & Sternberg, 1992; Pfeiffer, 2003).

### Barriers to effective brainstorming

Three major categories of barriers explain the improved performance of nominal group over individuals. These are emergence of judgments during generation, members giving up on the group and inadequate structure of interaction. Applying Decisions Inappropriately: Numerous studies have pointed out the existence of uniformity pressure and evaluation apprehension in brainstorming groups. The productivity of brainstorming groups may be inhibited by fear of critical evaluation and the participants desire to go along with dominant pattern of idea generation. In the present study, it was found that lack of participation by those who were more influenced by the fear of evaluation allowed others to dominate during discussion, especially in the early phase of the session. This result was on par with the findings of Dunnette, Cambell, & Jaastad, 1963; Vroom, Grant & Cotton 1969). Fear of being judged and pressure to stay within the bounds of existing options clearly have an inhibiting effect on the performance of groups when their task is generating many, varied and unusual ideas. It also highlights the view that there may be other significant factors that impact group performance.

**Giving Up on the Group:** Individuals give up on a group during brainstorming for a number of reasons. In the present study also, it was found that free riding, evaluation apprehension, blocking, social matching effect and illusion of group productivity can limit the output of real brainstorming. The present result was found on par with the studies of Henningsen, Cruz & Miller, 2000; Kerr & Bruun, 1993 who reported that free riding (where individuals feel that their ideas are less valuable when combined with the ideas of group at large), social loafing, matching of effort can limit the productivity of real brainstorming groups. This barrier lowers motivation and efforts when individuals work collectively.

Karau & Williams (1993) defined social loafing as "the reduction in motivation and effort when individuals work collectively compared with when they work individually or co-actively". Working co-actively is when individual work in the real or imagined presence of their, but their inputs are not combined with the inputs of others. Social loafing results when there is a loss of personal accountability for performance. Individuals are not as likely to be held personally accountable for the results (positive or negative) when working in a group. Typical behaviour manifested by reduced accountability includes less focus on performance standars or greater reliance on an individual high performer in a group (Kerr & Bruun, 1993). Thus, students can "hide in crowd" with less concern over being held personally accountable for (poor) group performance (Davis, 1969).

Interacting within a Limiting Process Structure: This is the third challenge faced in real brainstorming. The structure of interaction can inhibit productivity. This is in other words called production blocking or procedural mechanism effect. Production blocking refers to the impact of group process that encourages only one person to talk at a time (Bouchard & Hare, 1970; Diehl & Stroebe, 1987) or having one person recoding ideas at a flipchart (Mullen, Johnson & Salas, 1991). Though this challenge was faced by my student's community at first, later they were asked to give their ideas one by one on the same piece of paper where they can equally contribute for the proposed theme. But, keeping their first experience on production blocking, it was found that the prime contribution to this was lack of procedures that encourage simultaneous processing. Significant difference on group productivity depending on such variables as ideas recording method, pre-session instructions and group size.

### **Overcoming the Barriers**

A great deal of brainstorming sessions has focused on determining the barriers to group productivity. Hackman (1987) urged researchers to shift their focus from productivity losses to productivity gains. Two promising areas for overcoming the barriers outlined include the use of technology and facilitation (Scott G. Isaksen & John P. Gaulin, 2005).

### Use of technology

One area to overcome barriers outlined above includes Elec-

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tronic Brainstorming (EBS) or Group Support System (GSS) or Group Decision Support System (GDSS). These areas have been explored by number of researchers (Thompson and Coovert, 2002). Unlike nominal and individual group comparison, EBS links real group with virtual group via technology. Because the technology enables simultaneous participation and protection from criticism, it is capable of mitigating some of the factors that have been found to reduce productive ideas of students group. Electronic brainstorming enhances the creative capacity of brainstorming groups by overcoming the limitations of individuals being unable to express their ideas because others are talking. This line of research is increasing in empirical interest and support (Dennis & Valacich, 1994). In the present investigation, use of technology was avoided as the students were just introduced to what is brainstorming and how to perform in brainstorming. During this stage if they were asked to generate ideas through electronic mode, they may perceive this session as a Quiz programme and may even neglect such techniques.

### Use of facilitators

Group facilitators who manage the group interaction and record group ideas influence idea production. In the present study also, I was the group facilitator and rather saying I influenced the group in generating productive ideas, I could say I facilitated those who had no past or future task interdependence, who had no social relationship, who didn't generated ideas in the past, who lacked pertinent technical expertise, who lacked skills that complement other participants. From this facilitation I learnt how to gain expertise in doing brainstorming and leading brainstorming sessions.

#### CONCLUSION

Brainstorming is still promoted in English texts as a prewriting technique and is groups with clustering, looping and prewriting (Ramage, 2000). Though it fell out of vogue, brainstorming is once again an emerging technique for group idea generation especially in a classroom environment among students community. The participants in the study involved groups of unacquainted students who worked on the problems for only a short period of time. This situation may not appropriately simulate the process that may occur for organizational groups where there are involvements in information exchange or idea sharing over extended period of time. However, I have found that inexperienced nominal group of students demonstrated more ideas than when they were consulted individually. From this I would like to conclude that, a group's state of development, or how long it works at a task could moderate relative benefits of social and intellectual interventions. Social interventions may have more impact on groups that are older or work on tasks for longer period (Bradley, White & Mennecke, 2003). Supporting the above finding, my study also accomplished that, students in groups may generate more ideas when they socially mingle with farmers in a rural society, build good rapport with them and get deeper to them to analyze their problems. For doing this on field, they need to gain some practice in the classroom. That is why I used cognitive intervention by dividing students into groups and asked them to generate as much as ideas they can. From their involvement, I found that intellectual interaction had more impact on students group that are younger and work on tasks for shorter periods. Also, for those teaching gifted students, the benefits of brainstorming go well beyond generating ideas. Brainstorming can also result in improved coordination, better understanding of ideas generated and faster implementation of those ideas. In addition, individuals learn the importance of climate conducive to creativity, the value of diverse thinking and problem-solving styles and that creative thinking is enjoyable and powerful. The purpose of this article was to examine the use of brainstorming in idea generation, provide the results of exploratory study on what are facilitating factors for idea generation and what are the limitations in conducting a brainstorming session. Rather than throwing a baby out with the bathwater, I believe that conducting brainstorming session among students in classroom prior to any investigation or shootouts especially those who are going to get themselves involved in studying the people and society can provide valuable insights about an status of a real society that exist in the country as well as help them learn and apply this valuable tool prior to their exploration.

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