

2000

Idea Generation Decision Tools: A Comparative Study

Esther E. Klein

City University of New York, eklein9@aol.com

Follow this and additional works at: <http://aisel.aisnet.org/amcis2000>

Recommended Citation

Klein, Esther E., "Idea Generation Decision Tools: A Comparative Study" (2000). *AMCIS 2000 Proceedings*. 186.
<http://aisel.aisnet.org/amcis2000/186>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2000 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Idea Generation Decision Tools: A Comparative Study

Esther E. Klein, Department of Business, College of Staten Island, CUNY, *eklein9@aol.com*

Abstract

A sample of 171 college students was selected, with each participant randomly assigned to one of three treatments. Groups of 3 to 5 students were formed. Each group, using group support system (GSS) software, creativity support system (CSS) software, or no computer software (NCS) support, was asked to propose an innovative information system idea. Participants then rated the method used for idea generation on four measures: usefulness, difficulty, enjoyment, and overall satisfaction. The results indicated that using GSS software is viewed by users as being more useful, less difficult, more enjoyable, and more satisfying overall for idea generation than not using computers at all. Moreover, GSS software resulted in better ratings than CSS software on three of the above measures — usefulness, difficulty, and overall satisfaction, and the two methods were statistically equivalent with regard to enjoyment. The practical managerial implication of this study is that GSS is the support tool of choice for idea generation.

Introduction

As organizations increase their reliance on group work (Hayne and Rice, 1997; Katzenbach, 1998; Nunamaker, 1997), various techniques have become available to them to encourage and enhance decision-making and related activities, such as idea generation. In particular, group support system (GSS) software, designed to assist and coordinate interactions within small decision-making groups, is gaining wider acceptance in the corporate environment. Specific implementations of GSS include such products as VisionQuest, SAMM, GroupSystems, and Lotus Notes.

Another set of techniques, creativity support system (CSS) software, is employed to stimulate creative thinking in individuals or members of small groups involved in decision-making by encouraging users to think outside their normal parameters (see, e.g., Massetti, 1996; VanGundy, 1992). CSSs use a number of different techniques that aim to capture creative solutions to problems, including open-ended question-and-answer options and focused structures (Marakas and Elam, 1997; Massetti, 1996). CSS encompass such software packages as ThoughtPath Problem Solver (formerly MindLink) and IdeaFisher.

Connolly (1993) and Sosik, Avolio, and Kahai (1998) demonstrated that GSS is a valuable idea-generating tool. Similarly, Massetti (1996) found that CSS is useful for generating innovative ideas. Comparing GSS with CSS, Klein and Dologite (2000) reported that both were equally effective in generating innovative ideas, suggesting that both had unique features that facilitated creative thought. With respect to GSS, Klein and Dologite argued that the anonymity-featured GSS encouraged greater participation by women because of the absence of gender cues, which eliminated gender stereotyping and the resultant devaluation and discouragement of women's contributions to the group (see also Gopal, Miranda, Robichaux, and Bostrom, 1997; Herschel, 1994; Leaper, 1998; Sell, 1997). Concerning CSS, Klein and Dologite suggested that the presence of creativity-enhancing cues resulted in an added dynamic to the group process, which Massetti (1996, p. 93) speculates as consisting of the framing of thought in such a way that the ideas generated actually represent particular qualities.

Although research has been conducted on GSS and on CSS individually, a gap exists with respect to studies comparing GSS and CSS. Recently, Klein and Dologite (2000) compared GSS and CSS with regard to outcomes, i.e., the innovativeness of ideas generated. This paper aims to further fill the gap in the literature by comparing GSS and CSS with respect to the idea-generating experience itself. Specifically, the present study compares GSS, CSS, and no computer software support (NCS) on usefulness, difficulty, enjoyment, and satisfaction with the idea-generating experience.

Method

A sample of 171 undergraduate students majoring in business at a large urban university was selected. Each participant was randomly assigned to one of three treatments: GSS, CSS, or NCS. These students, working in groups of three to five, were all given the same task to complete. Specifically, each group, meeting for only one experimental session, was asked to propose an innovative information system idea that could be used to improve the operation of a restaurant. Each session was facilitated by the same facilitator (no parallel sessions).

There were a total of 46 groups and they were given approximately one hour to suggest a solution to the problem. Those groups in the GSS condition used VisionQuest, the CSS groups used MindLink, and the NCS groups solved the problem using a manual pen and paper

technique. After presenting their solution, individual participants rated the method used on four 7-point scales, each scale being anchored at the end-points: **Usefulness**, ranging from “extremely useful” (1) to “not at all useful” (7); **Difficulty**, ranging from “extremely difficult to use” (1) to “not at all difficult to use” (7); **Enjoyment**, ranging from “extremely fun to participate” (1) to “not at all fun to participate” (7); and **Overall Satisfaction**, ranging from “extremely satisfied” (1) to “not at all satisfied” (7).

Results and Discussion

Table 1 displays the means for the four measures. A multivariate analysis of variance (MANOVA) on these four measures for the three treatment groups resulted in a Wilks' Lambda of .884, $p < .01$. This result indicates that the vectors of four means for the three treatments were statistically different.

Table 1. Means for the Three Treatments on the Four Measures

	GSS	CSS	NCS
Usefulness	1.81 (64)	2.58 (50)	2.59 (56)
Difficulty	5.91 (64)	5.22 (49)	5.02 (54)
Enjoyment	2.02 (64)	2.35 (48)	2.71 (56)
Overall Satisfaction	1.64 (64)	2.12 (50)	2.16 (57)

Note: Sample sizes are in parentheses

The univariate one-way ANOVAs for each of the four measures was also significant (see Table 2). A Student-Newman-Keuls test was used for making a posteriori tests at the .05 level on each of the four measures.

For the **usefulness** measure, the mean rating generated by participants who had been exposed to the GSS treatment (1.81) was significantly different from the mean ratings generated by participants who had been exposed to the CSS treatment (2.58) and those who had used NCS (2.59). The participants in the GSS treatment rated the software they used to generate ideas as being more useful than did the participants in the CSS and NCS treatments. There was no significant difference between the ratings of the participants in the CSS and NCS treatments.

For the **difficulty** measure, the mean for GSS treatment participants (5.91) was significantly different from the means for the CSS (5.22) and NCS (5.02) treatment participants. Specifically, the GSS treatment participants rated the software they employed as being less difficult to use than did participants in the other two treatments. Additionally, there was no significant difference between the ratings of the CSS and NCS treatment participants. As

complexity is generally associated with technology, these findings are counterintuitive and unexpected. As such, further study on the difficulty associated with the type of support used appears warranted. If future investigations confirm these unanticipated findings that GSS is less difficult than CSS and NCS and that there is no significant difference between CSS and NCS, the practical managerial implication is that GSS is the support tool of choice for idea generation.

For the **enjoyment** measure, the mean ratings for the GSS (2.02) and CSS (2.35) treatment participants were not statistically different and the means for the CSS (2.35) and NCS (2.71) treatment participants were also statistically equivalent. Participants using GSS rated their software as being more fun to use than those not using any software (NCS). The reason that there was no statistically significant difference between GSS and CSS on enjoyment may be due to the fact that participants in both these treatments were using technology to generate ideas. Thus, more important than the software employed (GSS or CSS) is the use of computers. Computer usage may provide the major part of the enjoyment, especially for business students.

Table 2. One-Way ANOVA for the Four Measures

Usefulness:					
<u>Source</u>	<u>S.S.</u>	<u>d.f.</u>	<u>M.S.</u>	<u>F-Value</u>	<u>Sig.</u>
Among	23.81	2	11.91	5.89	<.003
Within	337.48	167	2.02		
Total	361.29	169			
Difficulty:					
<u>Source</u>	<u>S.S.</u>	<u>d.f.</u>	<u>M.S.</u>	<u>F-Value</u>	<u>Sig.</u>
Among	25.71	2	12.86	4.80	<.009
Within	438.95	164	2.68		
Total	464.66	166			
Enjoyment:					
<u>Source</u>	<u>S.S.</u>	<u>d.f.</u>	<u>M.S.</u>	<u>F-Value</u>	<u>Sig.</u>
Among	14.58	2	7.29	3.28	<.04
Within	367.39	165	2.23		
Total	381.98	167			
Overall Satisfaction:					
<u>Source</u>	<u>S.S.</u>	<u>d.f.</u>	<u>M.S.</u>	<u>F-Value</u>	<u>Sig.</u>
Among	10.03	2	5.02	4.02	<.02
Within	209.59	168	1.25		
Total	219.63	170			

For the **overall satisfaction** measure, the mean for the GSS treatment participants (1.64) was significantly different than the means for the CSS (2.12) and NCS (2.16) treatment participants. Participants using the GSS software rated the method higher on overall satisfaction than did participants in the other two treatments. There was no significant

difference between the ratings of the CSS and NCS treatment participants.

Conclusion

This study demonstrates that GSS software is viewed by users as being more useful, less difficult, more enjoyable, and more satisfying overall for idea generation than not using computers at all. In particular, this study indicates that GSS results in better ratings than CSS on three measures: usefulness, difficulty, and overall satisfaction. The two methods were statistically equivalent with respect to enjoyment.

As the participants in this study were all business students — and hence can be regarded as surrogates for managers, it would seem reasonable for corporations to consider using GSS for the purpose of generating ideas. There is no reason to believe that executives will find GSS to be intimidating or overly difficult to use. On the contrary, this study suggests that executives will find GSS enjoyable to use — more enjoyable than pen and paper techniques.

References

- Connolly, T. "Behavioral Decision Theory and Group Support Systems," in *Group Support Systems: New Perspectives*, L. M. Jessup and J. S. Valacich (eds.), Macmillan, New York, 1993, pp. 270-280.
- Gopal, A., Miranda, S. M., Robichaux, B. P., and Bostrom, R. P. "Leveraging Diversity with Information Technology: Gender, Attitude, and Intervening Influences in the Use of Group Support Systems," *Small Group Research*, (28:1), 1997, pp. 29-71.
- Hayne, S. C., and Rice, R. E. "Attribution Accuracy When Using Anonymity in Group Support Systems," *International Journal of Human-Computer Studies*, (47), 1997, pp. 429-452.
- Herschel, R. T. "The Impact of Varying Gender Composition on Group Brainstorming Performance in a GSS Environment," *Computers in Human Behavior*, (10), 1994, pp. 209-222.
- Katzenbach, J. R. *The Work of Teams*, Harvard Business School, Boston, 1998.
- Klein, E. E., and Dologite, D. G. "The Role of Computer Support Tools and Gender in Innovative Information System Idea Generation by Small Groups," *Computers in Human Behavior*, (16), 2000, pp. 111-139.
- Leaper, C. "Decision-Making Processes Between Friends: Speaker and Partner Gender Effects," *Sex Roles*, (39:1), 1998, pp. 125-133.
- Marakas, G., and Elam, J. J. Creativity enhancement in problem solving: through software or process? *Management Science*, (43), 1997, pp. 1136-1146.
- Masseti, B. "An Empirical Examination of the Value of Creativity Support Systems on Idea Generation," *MIS Quarterly*, (20:1), 1996, pp. 83-97.
- Nunamaker, J. F. Jr. "Future Research in Group Support Systems: Needs, Some Questions and Possible Directions," *International Journal of Human-Computer Studies*, (47), 1997, pp. 357-385.
- Sell, J. "Gender, Strategies, and Contributions to Public Goods," *Social Psychology Quarterly*, (60:3), 1997, pp. 252-265.
- Sosik, J. J., Avolio, B. J., and Kahai, S. S. "Inspiring Group Creativity: Comparing Anonymous and Identified Electronic Brainstorming," *Small Group Research*, (29:1), 1998, pp. 3-31.
- VanGundy, A. B. *Idea Power*. AMACOM, New York, 1992.