Effectiveness of group decision support systems (GDSS) in learning environments

Zachary Kelly | Dr. Donna McAlister-Kizzier mentor | College of Business and Technology

 Purpose

In order to sustain competitive edge, organizations and students in the United States require strong critical and creative thinking ability. This research will investigate the effect of group decision support system features on critical and creative thinking in undergraduate and graduate environments.

 Methods

- Surveys after an applied activity in multiple volunteer (convenience) Morehead State business core classes (IRB clearance achieved)
- Exploratory Phase I piece of a larger study
- Two treatments using similar tools
  - GDSS using Facilitate Pro n=16
  - Blackboard poll features n=11

 Research Questions

1. To what extent, if any, does the decision-enhancing features of GDSS systems (specifically anonymity, concurrent engagement, diversity equalization, increased engagement in less time, and analytics) affect the quality of outcomes as measured via critical/creative thinking activities. The following six learning features were assessed: (1) solution quality, (2) solution creativity, (3) quality of contributions from participants, (4) honest input from participants, (5) consideration of all ideas, and (6) productive use of time for solutions.

2. What insight can be gained to enhance critical/creative thinking in collegiate and organizational education from the results of the analysis of the study results?

 Recommendations

- Future Research
  - Extend study to assess the effect of additional variables such as (1) academic discipline (quantitative-based such as finance, economics, accounting, science, math, etc. vs. qualitative based disciplines such as management, organizational behavior, management information systems, writing, behavioral, sociology, education, etc.), (2) class level (lower division undergraduate, upper division undergraduate, graduate, organizational training) and/or (3) delivery mode (courseware, hybrid, face to face)
  - Expand the data set via additional research
  - Educators and Practitioners
  - For high-level critical and creative thinking activities in classrooms, such as case discussions, service-learning projects, and application projects, consider incorporating GDSS systems in class and team-based activities. This research indicates that doing so will achieve significantly higher solution quality and creativity as well as more inclusion in idea generation than standard technological or more traditional tools.

 Results

 Learning Quality Factor #1

- Solution Quality

 Learning Quality Factor #2

- Solution Creativity

 Learning Quality Factor #3

- Quality of Contributions from Participants

 Learning Quality Factor #4

- Honest input from Participants

 Learning Quality Factor #5

- Consideration of all Ideas

 Learning Quality Factor #6

- Productive use of time for Solutions

 Individual Conclusions

- ANOVA indicated a significant difference in solution quality between GDSS and Blackboard with quality higher in the GDSS treatment (.000)
- ANOVA indicated a significant difference in solution creativity between GDSS and Blackboard with quality higher in the GDSS treatment (.033)
- ANOVA indicated no significant difference in the Quality of Contributions from Participants between GDSS and Blackboard with quality higher in the GDSS treatment (.157)
- ANOVA indicated no significant difference in Honest Input from Participants between GDSS and Blackboard with quality higher in the GDSS treatment (.293)
- ANOVA indicated a significant difference in Consideration of all Ideas between GDSS and Blackboard with quality higher in the GDSS treatment (.001)
- ANOVA indicated no significant difference in Productive Use of Time for Solutions between GDSS and Blackboard with quality higher in the GDSS treatment (.358)

 Conclusion

- The results indicated that decision-enhancing features of group decision support systems (GDSS) specifically anonymity, concurrent engagement, diversity equalization, increased engagement in less time, and analytics) significantly affect the quality of the following three learning features as measured by critical/creative thinking activities: (1) solution quality, (2) solution creativity, and (5) consideration of all ideas.
- ANOVA indicated a significant difference in the five learning factors based on discussion mode (GDSS vs Blackboard) studied: (1) solution quality (.000), (2) solution creativity (.033), and (5) consideration of all ideas (.001). In each case significantly higher quality was achieved in the GDSS discussion mode.
- Significant difference was not found between discussion modes (GDSS vs Blackboard) for the following learning factors: (3) Quality of Contributions from Participants (.157), (4) Honest input from Participants (.293), and (6) Productive use of time for Solutions (.358).
- Results are highly consistent with findings in GDSS business effectiveness studies in which quality of solution is significantly enhanced when GDSS is applied. When this research is applied in learning environments, as in business (GDSS) study results, the quality of the outcome, that is the solution, is significantly enhanced. In addition, creative quality of the solution increases as does the ability to effectively consider all ideas from participants. This is in concert with findings in business studies. Thus significance was discovered in all process and output quality factors in the learning environment. However, significance was not discerned in the quality of input, which in all cases, lies not in the group structure but rather in individual learners. Since GDSS is by its very nature and technological structure designed to enhance group decision making, this is a logical result.