Online Role Play Simulation to Tackle Groupthink – Case Study of a Crisis Management Training

Lawrence Leung, Nancy Law, The University of Hong Kong, Pokfulam Hong Kong
Email: h8690182@hku.hk, nlaw@hku.hk

Abstract: Decision-makers have to face many challenges during crisis management: ill-structured problem, time stress, incomplete information and involvement of multiple parties. Groupthink is a term coined by psychologist (Janis, 1972), Groupthink victims ignore alternatives and tend to make irrational decisions in facing crises. Many researchers suggest that role play simulation (RPS) is a suitable tool for crisis management training for the realisation of collaboration and authentic situation awareness. In this paper, a case study of crisis management training in the context of law enforcement using online RPS is illustrated. By using Bales' Interaction Process Analysis (IPA) method, the interactions of participants in training are observed and categorised. The results show that using online role play simulation in crisis management training has positive effect on the reduction of Groupthink tendency.

Introduction

Crisis management is a set of actions taken to exert control over the events of a crisis to minimize losses. It is similar to risk management, except that the events are real, not potential, and action takes precedence over planning (Sniezek, Wilkins & Wadlington, 2001). Crisis management, to be effective, involves making appropriate decisions under severe time pressure and uncertainty. The objective of crisis management training is to enhance the ability to solve problems by adapting very quickly to a fast changing situation. Training in crisis management is essential to many organisations nowadays, especially law enforcement agencies. Crisis management is a highly complex subject and decision-making is a core process of it. Decision-making is critical in nature and also ill-structured, involving multiple parties, a lot of information from various sources. Moreover, the decision has a very short time frame to make, but the decision may cause a devastating consequence. One important challenge in crisis management training is inducing the psychological processes that associated with the acute stress experienced in real-world crises. Acute stress is a state that occurs in situations of potential harm, time pressure, and arousal (Sniezek, Wilkins & Wadlington, 2001). A most important feature of decision-making in crisis management is that it is group activity, dynamic in nature and hard to teach.

Crisis decision-making in law enforcement context is considered to be naturalistic. Naturalistic Decision Making (NDM) research emerged in the 1980s by Gary Klein to study how people make decisions in real-world settings. Realism is important, as lack of realism can prevent transfer of training, especially for performance under time pressure (Zakay & Wooler, 1984). The NDM framework emphasizes the role of experience in enabling people to rapidly categorize situations to make effective decisions (Klein, Orasanu, Calderwood, & Zsambok, 1993). Many researchers agree that role play simulation is a suitable method for crisis management training (Klieboer, 1997; Friedman 2004; Borodzicz & Haperen, 2002; Borodzicz, 2005; Miller, 2009). Their arguments include: offering trainees a setting approximating real-life experiences to learn how to apply insights from crisis management theories, supporting "learning by doing" in a safe environment, engaging collaboration and adopting scenario-based training. Effective crisis management simulations encourage participants to perceive the scenario as a threat, with time limitations for effective data gathering. Simulations should produce the similar reactions and feelings in participants as real life crisis events, such as tension, uncertainty, time pressure, sense of inadequate information and frustration (Gredler, 1992).

Groupthink

Groupthink was originated by Irving Janis in his book Victims of Groupthink in 1972, and explained how group made poor decisions during the decision-making process. Janis coined the term "Groupthink" to refer to "a mode of thinking that people engaged in when they are deeply involved in a cohesive in-group, when members' striving for unanimity override their motivation to realistically appraise alternative courses of action." In summary, Groupthink occurs when the pressure to conform within a group interferes with that group's analysis of a problem and causes poor group decision-making. Groupthink victim's creativity, uniqueness, and independent thinking are lost in the pursuit of group cohesiveness. The hypothesis was supported by Janis's hindsight analysis of several political-military fiascos and successes that were differentiated by the occurrence or non-occurrence of antecedent conditions, Groupthink symptoms, and decision-making defects. The political-military fiascos that Janis studied including: Nazi Germany's decision to invade the Soviet Union in 1941, the Pearl Harbour Incident, the Bay of Pigs Crisis, North Korean Invasion, the escalation of the Vietnam War and the Watergate Cover-up.

In groupthink research, case study, laboratory experiment and content analysis are the major methods used. However, it can be argued that online role play simulation should be more comprehensive in facilitating decision-making training in crisis management or avoidance of groupthink in specific. The arguments include: (i) Decision-making training concentrates on process not outcome alone and (ii) Decision-making is not a singularity issue, but combination of multiple decision types and events (Orasanu & Fischer, 1997). In fact, these arguments align with Mohamed & Wiebe (1996)'s conclusion in Groupthink research that, Groupthink is a continuous process, rather than a list of discrete events. Furthermore, the process flow of Groupthink is non-deterministic and probabilistic instead of deterministic or statically formulated. In other words, it is not necessary for the entire antecedent conditions have to be present for Groupthink to occur. Rather, the more antecedent conditions that are present the greater the risk of developing the symptoms of Groupthink (Rosander, Stiwne and Granstorm, 1998). Moreover, Esser and Lindoerfer (1989) have revealed the similar findings with Rosander, Stiwne and Granstorm. Therefore, it can be concluded that more Groupthink symptoms then lead to a greater probability of defective decision-making.

Tackling Groupthink with Online Role Play Simulation

Role Play Simulation (RPS) is being increasingly appreciated as a useful technique to foster virtual learning processes (Lombard & Biglan, 2009). RPS takes inspiration from "situated constructivism" approaches, which state that an educational experience has to be as authentic and genuine as possible, so that learners can observe and critically reflect on real situations (Winn, 1993). Moreover, RPS is directly rooting from the situated learning approaches of Goal-Based Scenario (Schank, 1997); where the learner is engaged in pursuing a goal within a simulated environment in order to master a set of skills. Role Plays are techniques based on such principles; which are increasingly being adopted in CSCL contexts (Persico D., Pozzi F. & Sarti L., 2008). In fact, RPS is a new area in CSCL research that professional learning can apply.

Online role play simulation, a special form of CSCL, is complied of a set of technologies in an online environment for collaborative learning. Online RPS is designed to support and structure group interactions for the purpose of information exchange, problem solving and decision-making. Through the development of various scenarios, the crisis decision process can be realised and monitored. Online role play simulation supports activities such as idea creation, message exchange, project planning, document preparation, and joint planning and decision-making that Group Support System (GSS) usually provides (Poole & DeSanctis, 1989). Moreover, features of online role play simulation are believed to break down hierarchies that dominate typical meetings (Zigura, Poole & DeSanctis, 1988) and to equalise the participation of all group members. In terms of the context of group decision support, online role play simulation usually consists of networked computers with monitors for group members in simulating crisis decision-making and aggregating group opinions. Researches have proved that computer technology based system can help mitigate the negative effects of antecedent conditions of Groupthink. These systems usually include process structuring, a public screen, anonymity, simultaneity, extended information processing, and access to external information (Miranda, 1994; Chidambaram, Bostrom & Wynne, 1991). System with anonymity, simultaneity, process structuring, and the public screen can foster productive conflict management (Miranda, 1994). As those features contribute to a task-focus thereby preventing unproductive conflict that is unrelated to the issue at hand. Those features also promote group members' freedom to participate in the discussion. As such, a high amount of issue-based conflict results. As a matter of fact, such constructive conflict can also promote an understanding of the problem and of opposing frames of reference as well as an exploration of alternatives. Consequently, a greater differentiation among group members' opinions may occur. When a group possesses Groupthink antecedents, it may not be possible or even desirable, to change the group's structure. However, it is possible to prevent the development of Groupthink by ensuring that each specific group decision is made under conditions of vigilance (Janis, 1982). This implies that the group examines a wide range of alternatives, carefully evaluates and re-evaluates these alternatives within the context of the group's objectives, search for relevant information, accurately processes all information, and undertakes detailed implementation and contingency planning.

Using Interaction Process Analysis to Understand Groupthink Processes

The Bales' (1950) IPA method and theory work on a relationship between social-emotional and tasks-based communication acts. It is generally agreed by researchers that there are two main dimensions of group life, task and social aspects (Frey, 1999), and these two dimensions are used to accomplish tasks and maintain group relationships. Bales' IPA can provide a detailed observational scheme at micro level for coding group members' communicative behaviour, such that it can be recorded, isolated and interpreted. By coding member's behaviour into discrete categories, researchers are able to interpret whether participants' comments are helpful or disruptive to the group and whether the communication acts are balanced (Schultz, 1999). Other coding schemes explored, Roter's (1991) (doctor-patient) and Eyberg & Robinson's (1983) (parent-child), are applied to specific domain of group interactions and are not appropriate for this study. In Bales's IPA, spoken or written communication will be broken into "units" consisting of a single thought or the equivalent of a simple sentence.

According to coding scheme, each communication or interaction unit can be assigned to one of 12 mutually exclusive categories. Details of the Bales' IPA coding scheme are illustrated in Table 1.

The Watergate cover up was confirmed as a Groupthink case by Cline (1994). Cline used Bales' IPA to analyse transcripts of the Watergate cover up case that were known to have made flawed decisions and found that too much emphasis on agreement resulted in unsuccessful outcomes. In "real life", groups that were found to be associated with Groupthink, the level of agreements were ten times higher than disagreement and, when Groupthink occurred in laboratory studies, agreement was seven times greater. Furthermore, Cline highlighted three components on contributing/avoiding Groupthink – Agreement, Task-based and Disagreement. According to Cline's research, too much agreement might decrease the chance of constructive conflict in decision-making; which was considered to be healthy. It was because under conflict situation more alternatives could be reviewed and decisions could be fully reviewed. Cline also found out that decision-making process was more task-based than socio-emotional based, as the discussion process was mainly focus on the solution finding, information gathering and sharing.

Table 1: Bales' 12 interaction categories (adopted from Bales,1950, p.9).

Code	Category	Remark
1	**Shows solidarity** – Raises other's status, gives help, encourages others, reinforces (rewards) contribution, greets others in a friendly manner, uses positive social gesture.	Social Emotional Area: Positive Reactions
2	**Shows tension release** – Jokes, laughs, shows satisfaction, relives or attempts to remove tension, expresses enthusiasm, enjoyment, satisfaction.	
3	**Agrees** – Shows passive acceptance, acknowledges understanding, complies, co-operates with others, expresses interest and comprehension.	
4	**Gives suggestion** – Makes firm suggestion, provides direction or resolution, implying autonomy for others, attempts to control direction or decision	Task Area: Neutral
5	**Gives opinion –** Offers opinion, evaluation, analysis, express a feeling or wish. Seeks to analyses, explore, enquire. Provides insight and reasoning.	
6	**Gives information –** Provides background or further information, repeats, clarifies, confirms. Brings relevant matters into the forum, acts that assist group focus.	
7	**Asks for information –** Asks for further information, repetition or confirmation. Acts used to request relevant information and understand the topic.	
8	**Asks for information –** Asks for further information, repetition or confirmation. Acts used to request relevant information and understand the topic.	
9	**Asks for suggestion –** Asks for suggestion, direction, possible ways of action. Requests for firm contribution, solution or closure to problem.	
10	**Disagrees** – Shows passive rejection, formality, withholds help, does not support view or opinion, fails to concur with view, rejects a point, issue or suggestion.	Social Emotional Area: Negative Reactions
11	**Shows tension** – Shows concern, apprehension, dissatisfaction or frustration. Persons interacting are tense, on edge. Act that express sarcasm or are condemning.	
12	**Shows antagonism** – Acts used to deflate others status, defends or asserts self, purposely blocks another or makes a verbal attack.	

Previous studies that have successfully used the IPA method to investigate various aspects of communication including: Hiltz and Turoff (1993) - comparison between face-to-face and computer mediated communication (CMC), Cline (1994) - Watergate cover up case research, and Gorse and Emmitt (2003) - construction meeting using CMC.

Study Design

Research Questions

1. In what ways does socio-emotional and task-based communications affect Groupthink tendency?
2. Can participation in Online Role Play Simulations be an effective means to reduce Groupthink tendency?

Method

This study involved 16 trainees from a law enforcement training institute in Hong Kong using role play simulation exercise as part of the 4-week crisis management training programme. In this exercise, trainees were randomly assigned to 4 different teams namely: Alpha (α), Beta (β), Gamma (γ) and Delta (δ) with specific functional roles in a crisis scenario. Each team was located in different rooms of the exercise vicinity without face-to-face contact. The facilitator or exercise controller at the control room could communicate with the

trainees of all groups through a computer networked role play simulation platform called SIMS (Scenario-based Interactive Role Play Simulation System). Participants did not know the scenario of the role play beforehand until the commencement of the exercise. SIMS provides all the simulated communication tools for law enforcement training, including chat-box, e-mail, beat radio, telephone and video conferencing system. Trainees can use the tools provided to carry out decision-making and Command & Control (C&C) operation during the role play simulation. In addition, Controller can also send out instant multimedia information (such as TV news, video clips) according to scenario development or enhancing realism of the crisis situation. All role play interactions and communications are logged by the system for data analysis and debriefing.

Procedure

The whole exercise was divided into two phases with two debriefings. Both Phases I and II were role play simulation, each phase had the same duration of 2 hours. At the beginning of the exercise, participants had to complete the 40-question Groupthink Index (Glaser, 1993) questionnaires, which were used to measure their Groupthink tendency before the exercise. Debriefing I was conducted after the completion of Phase I, in this 30 minutes session, the facilitator delivered a short introduction about Groupthink to participants. After a break, Phase II commenced. The Debriefing II was the post-exercise discussion. Facilitator discussed with participants about the exercise that was conducted. After the exercise, participants completed the Groupthink Index questionnaires again to understand the change of Groupthink tendency.

Data Collection and Method of Analysis

The interactions of the exercise were recorded by SIMS, including text (chat-box, e-mail), audio (simulated beat radio, telephone) and video (video conference). All the recorded transactions were then transcribed for analysis. Transcripts were coded according to IPA and in order to examine the impact of status differentials, a percentage (%) figure indicating the relative number of "units" by each team was computed to give an indication of their proportionate contribution to the overall interactions. Representative sections (10%) of text were double-coded by two independent raters to assess inter-rater reliability. The guidelines for IPA coding were clear and consequently agreement between raters approached 97%.

Result and Analysis

Measurement of Groupthink Tendency

Glaser's Groupthink Index (1993) is the instrument used in this paper. According to Glaser, the significance of Groupthink in decision-making can be divided into different categories by severity, it is suggested that an overall score (over the eight 'Groupthink symptoms') of less than 93 indicates 'Very insignificant' groupthink tendency; 94-111 indicates 'Insignificant' groupthink tendency; 112-129 indicates 'Moderate' groupthink tendency; 130-147 indicates 'Significant' groupthink tendency; and a score greater than 148 represents 'Very significant' groupthink tendency.

The change of Groupthink Index of each team, between the Phase I score and the Phase II score were: Team Alpha (-15.11%, Groupthink tendency reduced from High to Moderate), Team Beta (-8.48%, Groupthink tendency reduced from High to Moderate), Team Gamma (-17.88%, Groupthink tendency reduced from High to Moderate) and Team Delta (-20.49%, Groupthink tendency reduced from High to Moderate). As a whole, all teams had decrease in Groupthink tendency from High to Moderate but in different degrees. Interestingly, the performance of Team Beta was significantly lower than the other 3 teams. The reduction of Groupthink tendency indicates that online RPS may be a factor to trigger the change. However, it is not sufficient to reach a conclusion at this point, unless the positive effect between online RPS and change of Groupthink tendency is established. Therefore, the following IPA analysis is to investigate this relation. The coded profile of the interactions are summarised in Table 2 in sorting order of mean. From Table 2, it can be observed that the IPA category with highest mean is "Gives information (6)" and the lowest mean is "Shows antagonism (12)". The table reflects that exchange of information, suggestion and opinion are the dominant activities, compare to other social-emotional interactions. In fact, this implies that crisis decision-making has gone through the process of information gathering, discussion and team work. This distribution of IPA codes is significantly different from the study by Bales (1950), which was a face-to-face free form play. However, the distribution of IPA codes is similar to the study by Hiltz (1978) in certain extent on problem solving via computer conference. To address the research questions, two levels of analysis are performed. The first level analysis is on the relationship between socio-emotional/task-based communications. The second level analysis is on the relationship between the 4 interaction categories (Positive/Negative Socio-emotional and Giving/Asking Task-based) and the Groupthink tendency.

Table 2: Bales' IPA categories – sorted by mean.

IPA Category (code)	Mean	Std. Dev.	Team (%) – in % order
Gives information (6)	45	17.166	γ (26.55), α (20.29), δ (17.35), β (15.17)
Asks for information (7)	37.25	7.5	β (18.62), δ (17.51), γ (17.26), α (16.30)
Gives suggestion (4)	25	10.296	α (13.77), δ (11.98), γ (10.18), β (8.97)
Gives opinion (5)	24.75	10.079	δ (12.8), α (12.68), γ (11.06), β (7.59)
Asks for opinion (8)	24.25	3.304	β (15.17), γ (12.39), δ (9.68), α (9.42)
Asks for suggestion (9)	22.5	2.517	β (15.86), γ (11.06), δ (8.76), α (8.33)
Agrees (3)	18	5.354	δ (10.6), β (8.33), α (7.97), γ (6.64)
Disagree (10)	8.5	5.916	δ (15.5), α (5.4), β (2.07), γ (1.77)
Shows solidarity (1)	4.5	2.646	β (5.56), α (1.81), γ (1.33), δ (0.92)
Shows tension release (2)	3.75	2.217	α (2.54), β (2.07), δ (1.38), γ (0.88)
Shows tension (11)	2.25	1.708	α (1.45), δ (1.38), γ (1.98), β (0)
Shows antagonism (12)	0.25	0.5	β (0.69), α (0), γ (0),, δ (0)

First Level Analysis - Social-emotional and Task-based Interactions

Interaction data gathered using the Bales' IPA can be studied from a number of different perspectives. In this paper, the first level of analysis is the social emotional and task-based components of communication and their relationship with the change of groupthink tendency. There are 6 social-emotional acts (that is shows solidarity, shows tension release, agrees disagrees, shows tension and shows antagonism) and the 6 task-based communication acts (that is gives suggestion, gives opinion, gives information, asks for information, asks for opinion, and asks for suggestion).

Figure 1 presents the interaction for all teams observed during the role play simulation exercise. It shows consistent patterns of interactions during the exercise. The percentage between Socio-emotional and Task-based interaction are 17.25% and 82.75% respectively. The distribution of categories shows the pseudo-normal pattern typically found in task-oriented group (McGrath, 1984). Categories relating to task performance (4-9) occur more frequently than those relating to socio-emotional behaviours (1-3) and (10-12). Interactions concerned with giving information (4-6) are more frequent than that aim at eliciting information (7-9). It can be expected that task solution involves information exchange and interpretation and where roles during decision-making processes largely involve reporting of information gathered by individuals between teams. Positive socio-emotional interactions (1-3) are more common than negatives categories (10-12), suggesting a healthy level of interpersonal interaction. This distribution can reveal that crisis management interaction is more task-based, with 43.92% on Giving tasks (Categories 4,5&6) and 38.94% on Asking tasks (Categories 7,8&9). On the other hand, socio-emotional tasks contribute 12.17% on Positive socio-emotional (Categories 1,2&3) and 4.89% on Negative socio-emotional (Categories 10,11&12). Of all the four teams, Team Beta has the most interactions on Shows solidarity (Category 1) with 5.52% and the least interaction percentage on Disagree (Category 10) (2.07%) and Shows tension (Category 11) (0%). In addition, Team Beta has also the least percentage on Task-based interaction (13.33%) among all four teams. According to Cline (1994), Team Beta has shown a high degree of socio-cohesion, which can contribute Groupthink among team members and they do not engage in conflict during the exercise. However, conflict in discussion is considered to be useful for Groupthink avoidance (Cline, 1994).

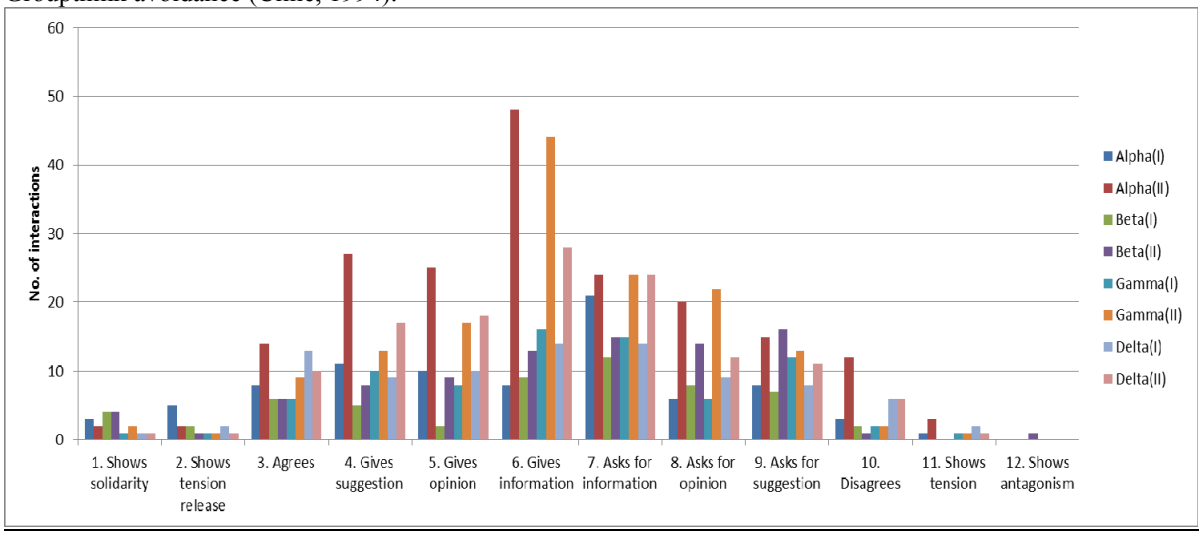

Figure 1. IPA Profiles of Teams.

To further understand the interaction pattern of Team Beta, the IPA profile in Phase I and Phase II are illustrated in Figure 2.

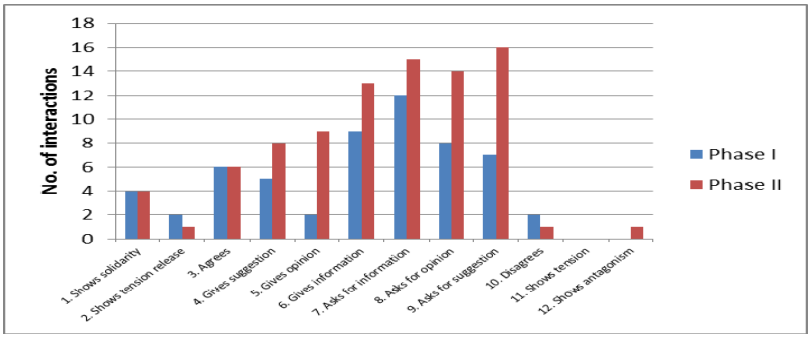

Figure 2. Team Beta (IPA Profile in Two Phases).

It can be revealed from Figure 2 that some decrease on Positive socio-emotional interaction – Shows tension (Category 2) and Negative socio-emotional interaction – Disagree (Category 10) and Shows antagonism (Category 12). However, not much improvement on Show solidarity (Category 1), Agrees (Category 3) and Shows tension (Category 11). It can also be seen that the major improvement is on task-based interaction, especially for the 4-9 categories.

Figure 3 is a graphical comparison of various Groupthink studies by Cline (1994) and the "Crisis Management" of this study. In this graph, the three major components on contributing/avoiding Groupthink are displayed in terms of percentage of interactions. It can be seen that "Crisis Management" has the least percentage (8.33%) of interaction on Agreement, which refers to Category 3 of IPA. According to Cline's research, too much agreement may decrease the chance of constructive conflict in decision-making; which is considered to be healthy. It is because under conflict situation more alternatives can be reviewed and decisions can be fully reviewed. In addition, the percentage of task-based interaction of Crisis Management (82.75%) is also the highest among other studies. It can observed that due to anonymity, simultaneity, extended information processing, and access to external information of the online role play simulation environment, participation of group members is encouraged. Such that the hierarchies or process structures that dominate traditional meetings can be broken. Furthermore, the percentage of Disagreement (Category 10) interactions is 3.94%, also lowest among the studies. "Crisis Management" scores a roughly 2:1 Agreement and Disagreement ratio, which implies a low Groupthink tendency according to Cline.

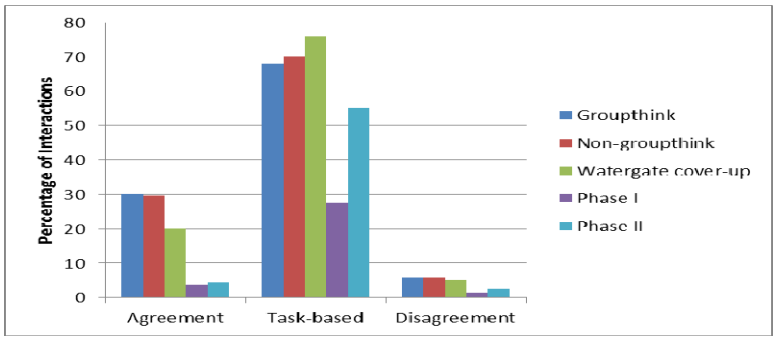

Figure 3. Comparison of IPA Profiles on Groupthink Studies.

Secondary Level Analysis – Interactions vs Change of Groupthink Tendency

The second level of analysis looks into the social-emotional and task-based components for more details. It is necessary to find out whether the 4 interaction categories (associated with the positive and negative social-emotional interaction, and giving and asking task-based interaction) are significantly related to the change of groupthink tendency. In this investigation, the interactions collected are divided into two groups, the successful group, that is transactions from teams α, γ and δ, and unsuccessful group, that is transactions from team β. To examine the social-emotional and task-based categories, individual IPA categories are grouped together accordingly. Positive social-emotional categories comprise of the aggregated data from Category 1 (Shows solidarity), 2 (Shows tension release) and 3 (Agrees). Negative social-emotional categories are also split into two groups – giving and asking task-based interaction. Giving task-based interaction included Category 6 (Gives information), 7 (Gives opinion) and 8 (Gives suggestion). Asking task-based interaction includes Category 7 (Asks for information), 8 (Asks for opinion) and 9 (Asks for suggestion). Table (3) provides a summarised comparison and statistical analysis of social-emotional and task-based interaction against the change of

Groupthink tendency. Finally, the Pearson's Chi square (χ^2) is used to examine the relationship between interaction levels and the change of Groupthink tendency. The findings are reported as probability values (ρ), the degrees of freedom are also stated. The findings are used as evidence supporting or rejecting of the hypothesis. The hypothesis is based on the acceptance that the level of interaction had a significant relation associated with the change of Groupthink tendency. In this paper, a significant difference is recorded as $\rho =<$ 0.05. The result shows that χ^2 is 14.994, degree of freedom (df) = 3 and ρ value of < 0.02, which is considered to be highly significant. Therefore, the hypothesis is accepted, such that Groupthink tendency reduction is highly related with the Positive/Negative socio-emotional and Giving/Asking task-based interactions.

Table 3: Results of positive and negative socio-emotional interaction, and giving and asking task-based interaction: Groupthink tendency reduction successful and not successful. (SPSS output).

Groupthink tendency reduction	Pos. Social-emotional	Neg.Socio-emotional	Giving Task-based	Asking Task-based	Total
Successful	82	40	333	264	719
Not successful	24	4	46	71	145
Total	106	44	379	335	864

In order to demonstrate the relationship of the hypothesis with the full set of IPA categories, a further analysis is carried out, and the results are tabulated in Table 4.

Table 4: Results of 12 IPA categories: Groupthink tendency reduction successful and not successful. (SPSS output).

Groupthink tendency reduction	IPA1	IPA2	IPA3	IPA4	IPA5	IPA6	IPA7	IPA8	IPA9	IPA10	IPA11	IPA12	Total
Successful	10	12	60	87	88	158	122	75	67	31	9	0	719
Not successful	8	3	12	13	11	22	27	22	23	3	0	1	145

The result shows that χ 2 is 31.842, degree of freedom (df) = 11 and ρ value of 0.002 (Assmp. Sig (2-sided))< 0.05, which is also considered to be highly significant. Therefore, the hypothesis is accepted, such that Groupthink tendency reduction is highly related with the 12 IPA categories.

Conclusion

From the result of the analysis, it is shown that participants have achieved a reduction of Groupthink tendency after the Online RPS exercise. Moreover, the results of the IPA analysis have also proved that online RPS has positive effect in the reduction of Groupthink tendency. Online RPS has the potential to provide scenario planning that is a cost effective supplement to traditional face-to-face training. This new form of planning simulation provides flexibility and ease of preparation while stimulating creative and critical thinking. The design of SIMS aligns with the NDM framework, such that SIMS allows representation of actual crises and provides immersive interface contributes to acute stress. With the adoption of multimedia technology, the audio-visual effects and simulated tools of SIMS enhance the degree of realism. In addition, critiques and arguments are allowed; mode of interactions is multi-way and without hierarchy. Moreover, trainer can assess trainee actions instantly and intervene constructively. Trainer has made use of the logged interactions in SIMS to discuss and elaborate a specific concept or knowledge among trainees during debriefing, which cannot be achieved without technology. This paper describes the procedure to use Bales' IPA for analyzing electronic discussions, and the analysis demonstrates that the group is clearly task-based and discussions are mainly concerned with the exchange of information or opinion. With a closer inspection of data or discussion dialogues, the group is characteristically by generally positive interpersonal relations, with little antagonism or conflict evident. The group functioned well in terms of task content and process. However, it should be acknowledged that the data generated are limited in scope and a more detailed content analysis based on qualitatively derived coded may be necessary to fully capture the detailed characters of the group.

References

Bales, R. F. (1950). Interaction process analysis. Cambridge, MA: Addison-Wesley.

Borodzicz, E., & Haperen, K. V. (2002). Individual and group learning in crisis simulations. *Journal of Contingencies and Crisis Management,* 10(3), 139-147.

Borodzicz, E. P. (2005). Risk, Crisis and Security Management. West Sussex, England: John Wiley &Sons Ltd.

Chidambaram, L., Bostrom, R. P. & Wynne, B. E. (1991). A Longitudinal Study of the Impact of Group Decision Support Systems on Group Development. *Journal of Management Information Systems*, 7(3).

Cline, R. J. W. (1994). Groupthink and the Watergate cover up. The illusion of unanimity. In L. R. Frey (Ed.) *Group Communication in Context: Studies of Natural Groups*. New Jersey: Lawrence Erlbaum.

Esser, J. K., & Lindoerfer, J. L. (1989). Groupthink and the space shuttle Challenger accident: Toward a quantitative case analysis. *Journal of Behavioral Decision Making*, 2**,** 167–177.

Eyberg, S.M., & Robinson, E. (1983). Dyadic parent-child interaction coding system: A manual. Psychological Documents, 13, 2424, Ms. No. 2582.

Friedman, S. (2004), Learning to make more effective decisions: changing beliefs as a prelude to action, The Learning Organization, 11(2), 110 – 128.

Frey, L.R. (1999). The handbook of group communication theory and research. London. Sage.

Glaser, R. (1993). Groupthink Index, Organizational Design and Development, King of Prussia.

Gorse, C. & Emmitt (2003). Investigating interpersonal communication during construction progress meetings: Challenges and opportunities. Engineering,Construction and Architectural Management, 10(4), 234-44.

Gredler, M. E. (1992). Designing and evaluating games and simulations. London: Kogan Page.

Hiltz, S. R., Johnson, K., & Agle, G. (1978). Replicating Bales' problem solving experiments on a computerized conference: A pilot study (Research Report No. 8). Newark: New Jersey.

Hiltz, S. R. et Turoff, M. (1993). Social and Psychological Processes in Computerized Conferencing. In The Network Nation: Human Communication via Computer. MIT Press, Cambridge, MA.

Janis, I. L. (1972). Victims of Groupthink, Houghton-Mifflin, Boston.

Janis, I. L. (1982). Groupthink, 2nd ed. Houghton-Mifflin Company, Boston.

Klein, G. Orasanu, J. Calderwood, R. & Zsambok, C.E. (Eds.) (1993). Decision Making in Action: Models and Methods (pp. 327-345). Norwood, NJ: Ablex.

Kleiboer, M. (1997). Simulation methodology for crisis management support JCCM 5(4): 198-206

Lombard, R. and Biglan, B. (2009). Implications of Role Play and Team Teaching as Strategies for Information Technology Pedagogy, Information Systems Education Journal, 7(20).

Miller, L. (2009). Psychological Principles and Practices for Superior Law Enforcement Leadership in Police Chief.

Miranda, S M. (1994). Avoidance of groupthink. Small Group Research, 25(1), 105-136.

McGrath, J.E. (1984). Groups: Interaction and Performance, Englewood Cliffs, N.J: Prentice-Hall.

Mohamed & Wiebe (1996). Toward a process theory of Groupthink. *Small Group Research*, 27(3), 416-431.

Orasanu, J. & Fischer, U. (1997). Finding decisions in natural environments: the view from the cockpit. In C.E. Zsambok & G. Klein (Eds.), Naturalistic Decision Making . Mahwah, NJ: Lawrence Erlbaum.

Persico, D., Pozzi, F., & Sarti, L. (2008). Fostering collaboration in CSCL. In A. Cartelli, M. Palma (Eds.), Encyclopedia of information communication technology, (pp. 335-340). Idea Group Reference.

Poole, M.S., & DeSanctis, G. (1989). Use of Group Decision Support Systems as an Appropriation Process, Proceedings of the Twenty-Second Annual Hawaii International Conference, 4, 149-157.

Rosander, M., Stiwe, D., & Granström, K. (1998). Bipolar Groupthink: Assessing groupthink tendencies in authentic work groups. Scandinavian Journal of Psychology, 39, 81-92.

Roter, D.L. (1991). The Roter Method of Interaction Process Analysis (RIAS Manual).

Schank, R. (1997). Virtual Learning: A revolutionary approach to building a highly skilled workforce. New York: McGraw-Hill.

Schultz, B.C. (1999). Improving group communication performance, an overview of diagnosis and intervention. In*:* L.R. Frey. The handbook of group communication theory and research. London, Sage. 371-394.

Sniezek, J. A., Wilkins, D. C., and Wadlington, P. (2001). Advanced Training for Crisis Decision Making: Simulation, Critiquing, and Immersive Interfaces, *Proceedings of the 34th Hawaii International Conference on Systems Science*s, Maui, Hawaii. January 5-7, 2001.

Winn, W. (1993). A constructivist critique of the assumptions of instructional design. In T. M. Duffy, J. Lowyck, & D. H. Jonassen (Eds.), Designing environments for constructive learning, 189-212. Berlin: Springer-Verlag Conference on System Sciences (HICSS-34), 3, 2001.

Zakay, D., & Wooler, S. (1984). Time pressure, training and decision effectiveness. Ergonomics, 27 (3), 273 - 284.

Zigurs, I., Poole, M. S., & DeSanctis, G. (1988). A study of influence in computer mediated group decision making. MIS Quarterly, December, 625-644.