

Public advertising plan study for effective shelter at a crisis moment

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Abstract: This study investigates the subjectivity of emergency rescue students regarding public advertising strategies for effective evacuation during a crisis situation. **Design/Methodology/Approach:** This study was conducted using an in-depth Q survey, and the data were analyzed. The study identified types through a survey using Q-factor analysis via the PC QUANL program. **Findings:** The analysis using the QUANL program revealed a total of four types. (1) Type 1 (N=7): Education-training & communication-strategy Type, (2) Type 2 (N=6): Advance preparations Type, (3) Type 3 (N=6): Media information use & active practice Type, (4) Type 4 (N=4): Report & media information use Type. **Conclusion:** This study will provide specific guidelines for effective evacuation during a crisis. It is essential to establish a standard manual that can respond to urgent disasters. A detailed explanation of various situations in preparation for dangerous times should be included in the basic procedures. **Practical implications:** Public relations strategies for active improvement concerning 'effective evacuation during a crisis' should be prepared. There should be sufficient promotional strategies and tactics that can be immediately utilized during a disaster.

Keywords: Crisis, Effective shelter, Public advertising, Q methodology, Subjectivity study.

1. Introduction

With the widespread adoption of artificial intelligence (AI) and the increasing importance of big data—hallmarks of the Fourth Industrial Revolution—public awareness of safety during various emergencies or crises has become a significant social issue in the digital media era [1-4]. As public demand for awareness about safety in online environments grows, it becomes essential to handle this information efficiently [5-8].

As the importance of safety in disasters and emergencies is emphasized, the Korean government has enacted safety-related laws such as the "Framework Act on the Management of Disasters and Safety." This law aims to protect the lives, bodies, and property of citizens from various disasters and to establish relevant policies. However, safety accidents continue to increase. The Sewol Ferry disaster on April 16, 2014, which occurred in Jindo, Jeollanam-do, exposed the overall shortcomings of Korea's safety management system, with the causes still not fully clarified. This event calls for a comprehensive review of the issues with government authorities' safety management.

This study has two main objectives: first, to diagnose the subjectivity of emergency rescue students regarding public advertising strategies for effective evacuation during a crisis; second, to identify detailed types and effectiveness factors to understand future improvements and directions. To find answers to the raised issues, the study utilizes Q-methodology for subjectivity research. The research questions are as follows: first, to identify the types of acceptance perceptions regarding public advertising strategies for effective evacuation during a crisis; second, to identify the homogeneous and heterogeneous characteristics among these types. The Q-methodology was employed to understand

the subjectivity of emergency rescue students regarding public advertising strategies for effective evacuation during a crisis [9-12].

2. Materials and Methods

2.1. Research Hypothesis

This study conducted an empirical and in-depth Q analysis of public advertising strategies for effective evacuation during a crisis situation. The QUANL program was used as the analytical method, and the research questions are as follows:

Research Question 1: Identify the types of acceptance perceptions regarding public advertising strategies for effective evacuation during a crisis situation.

Research Question 2: Compare the homogeneous and heterogeneous characteristics among these types.

2.2. Research Design

A literature review on public advertising strategies for effective evacuation during a crisis will facilitate a more efficient understanding of related research through an objective value analysis. The evaluation of public advertising strategies for effective evacuation during a crisis can not only provide an objective value but also suggest types. The specific research methods attempted in this process will be conducted through case studies after organizing various domestic and international materials step by step. The scope of the investigation includes all available literature in Korea as of now. The data collection period was from February to June 2024.

This study conducted an in-depth Q survey with emergency rescue students. Interviews focused on key research topics were conducted to gain a deep understanding of the perspectives on the dissertation topics.

The in-depth Q survey, a qualitative research method, follows the Laddering approach, which identifies themes from fundamental issues to more specific ones, rather than the Grand Tour Technique that finds themes on a few specific matters. This is an unstructured interview method, where the interview progresses entirely differently depending on the respondent's experiences and thoughts [13-16].

The study topics will be raised by dividing them into common and individual fields, using an evolutionary design method that includes research questions and utilizes the characteristics of qualitative research methods during the interviews.

In the in-depth Q survey, emergency rescue students' opinions were gathered, and the results of the initial interviews influenced the subsequent interview content. The listed interview items are not finalized at the proposal stage, and after about three interviews, they are summarized into statements with focused themes.

It is important to structure, identify, describe, and explain the various opinions derived from the R method and each type's characteristics. Based on this, the Q-methodology analysis results were derived based on the hypothesis.

Existing quantitative methodologies (R-methodology) have been primarily used for objective statistical analysis of public advertising strategies for effective evacuation during a crisis. Q-methodology analysis papers can offer insightful analysis by identifying factors within respondents' self-structures (schemas) related to communication. The unique feature of this study is that it differs from traditional research methods that deduce hypotheses from existing theories; instead, it discovers new hypotheses based on subjective images commonly held by people. Q-methodology starts from the actor's perspective and can explain correlations with other types based on each individual's different subjectivity structures. Researchers attempted Q-methodology to measure public advertising strategies for effective evacuation during a crisis. For this, the analysis work involved categorizing statements in the form of cards. To create these statements, the researcher formed a Q-population through interviews with professionals and, after selecting and categorizing a P-sample, obtained Q-

sort results. These results were then analyzed using Q-factor analysis through the PC QUANL program.

2.3. Q Sample and P Sample

This study utilizes statements regarding acceptance behavior types related to public advertising strategies for effective evacuation during a crisis situation. To comprehensively gather respondents' general ideas, opinions, and values, this study references relevant professional books and academic journals. Through in-depth interviews with emergency rescue students, 37 Q-population statements were extracted. Among the statements included in the Q-population, those with the highest representativeness concerning the topic were arbitrarily selected, and ultimately, a sample of 25 statements was chosen. The 25 statements were constructed to encompass all opinions and maintain a balance of positive, neutral, and negative views (see [Figure 1]).

Q-methodology deals with differences in importance within an individual rather than differences between individuals. Therefore, it is not limited by the number of P samples. Since the goal of Q research is not to infer the characteristics of a population from the characteristics of a sample, the P sample selection does not follow probabilistic sampling methods. Q research differs from R-methodology in that it does not consider demographic characteristics such as gender, age, or occupation. The final 25 participants, all emergency rescue students, were selected as the P sample after obtaining consent for the survey work through prior notice.

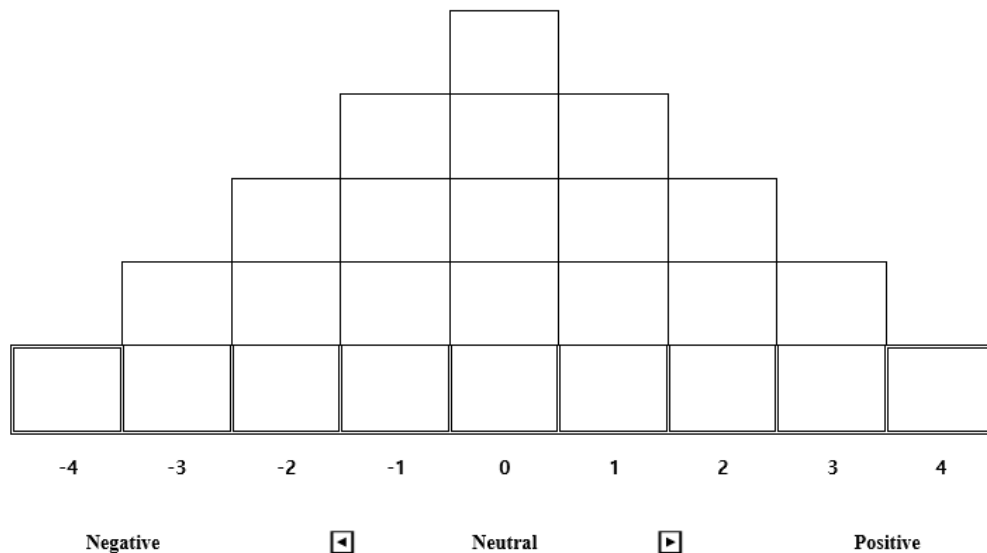


Figure 1.
Q-Sample sorting board and record sheet.

The Q-sort task involves respondents modeling their mental attitudes toward complex topics, issues, or situations. After reading the statements, the respondent is forced to categorize them within a certain distribution.

Table 1.
Coding-scores and statements by Q-distribution

| Distribution | 4 | 3 | 2 | -1 | 0 | 1 | 2 | 3 | 4 |
|----------------------|---|---|---|----|---|---|---|---|---|
| coding scores | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| number of statements | 1 | 2 | 3 | 4 | 5 | 4 | 3 | 2 | 1 |

The Q-sort process involves respondents reading each statement on the Q sample cards and categorizing them into three main groups: positive (+), neutral (0), and negative (-). They then select the most positive statements one by one and categorize them from the outer (+4) to the inner part. The negative statements are also categorized, and a follow-up in-depth interview is conducted on the single statement placed at each end. This provides useful information for interpreting the Q-factor.

After completing the P sample survey, the collected data is scored using a Q sample distribution, starting from 1 point for the most negative case (-4), then 2 points (-3), 3 points (-2), 4 points (-1), 5 points (0), 6 points (+1), 7 points (+2), 8 points (+3), and 9 points (+4) for the most positive case (see [Table 1]). The assigned scores are coded in statement number order and analyzed using the PC QUANL program.

<Questionnaires>

1. Public service announcements require practical training and practice to prepare citizens for real-life situations.
2. Public service announcements encourage following the instructions of safety personnel.
3. Create public service announcements that foster empathy and communication.
4. Strictly limit public service announcements that involve excessive packaging.
5. Public service announcements focus on practicality for SNS users.
6. Public service announcements should include information on immediately informing those nearby and contacting disaster response teams and the fire department in case of a crisis.
7. Practical guideline public service announcements are needed.
8. There is a need to create public service announcements that are suitable for effective evacuation in the era of AI and Chat GPT.
9. It is urgent to address the issues of existing public service announcements.
10. Public service announcements make good use of evacuation sites inside and outside buildings.
11. Public service announcements require swift initial actions.
12. Public service announcements require legal and institutional regulatory policies.
13. Public service announcements present proper solutions through social and cultural consensus.
14. Ethical regulatory guidelines are needed for the production of public service announcements.
15. Public service announcements inform citizens of the seriousness through emergency disaster texts.
16. Public service announcements consider various online platform channels.
17. Public service announcements need to include content that encourages calm behavior in urgent situations.
18. The production of public service announcements requires deep reflection from the creators.
19. Public service announcements are based on tailored issues suitable for the post-COVID environment.
20. Public service announcements should be designed to enable quick evacuation through emergency exits.
21. Public service announcements that help with effective evacuation need to be well-prepared in advance.
22. Create public service announcements that encourage the use of stairs, not elevators, in case of a crisis inside a building.
23. Public service announcements should include reporting to 119 or 112 and requesting help for evacuation.
24. Public service announcements that encourage effective evacuation inform those around you of

the situation.

25. Public service announcements that encourage effective evacuation are designed to help citizens make good use of media information.

3. Results and Discussion

The Q-factor analysis of emergency rescue students' perceptions of acceptance types regarding public advertising strategies for effective evacuation during a crisis situation is as follows.

As shown in [Table 2], it explains about 45% (0.4518) of the total variance, with four analyzed types consisting of 7, 6, 6, and 2 participants each. The number of participants per type is not of great significance. The number of participants with a factor weight of 1.0 or higher was 3, 4, 1, and 2, respectively. The second type had the highest factor weight, with eigenvalues indicating variance sizes of 4.1303, 2.9463, and 2.4111 for the general types.

Table 2.

Q-analysis explanatory power, eigenvalues, and percentage of variance

| Eigen value | 4.1303 | 2.9463 | 2.4111 |
|------------------------|--------|--------|--------------------------|
| Percentage of variance | .1967 | .1403 | .1148 |
| Cumulative frequency | .1967 | .3370 | .4518(explanation power) |

Table 3.

Correlations between types

| | Type 1 | Type 2 | Type 3 | Type 4 |
|--------|--------|--------|--------|--------|
| Type 1 | 1.000 | - | - | - |
| Type 2 | .064 | 1.000 | - | - |
| Type 3 | -.034 | -.017 | 1.000 | - |
| Type 4 | -.893 | .010 | .066 | 1.000 |

[Table 3] shows the correlation coefficients between each type, indicating similarities and differences among the types. The correlation between Type 1 and Type 4 (-.893) shows a negative relationship. The correlation between Type 1 and Type 2 and between Type 3 and Type 4 showed a slight positive relationship.

[Table 4] shows the factor weights by demographic characteristics of respondents according to type. The factor weights analyzed for each type among the total 21 respondents included in the four types were '3, 4, 1, 1'. The 'factor weight' is a measure that determines respondents' explanatory power for the type.

Table 4.
Demographic characteristics of the subjects and factor weights by type.

| TYPE | ID | Gender | Age | Major | Factor weights |
|--------------------|----|--------|-----|--------------|----------------|
| TYPE 1 (N= 7) 3 | 2 | Male | 23 | Paramedicine | 0.5724 |
| | 5 | Female | 23 | Paramedicine | 2.9489 |
| | 10 | Male | 23 | Paramedicine | 3.3459 |
| | 12 | Male | 23 | Paramedicine | 1.0042 |
| | 18 | Male | 26 | Paramedicine | 0.0201 |
| | 20 | Male | 25 | Paramedicine | 0.9750 |
| | 21 | Female | 23 | Paramedicine | 0.3253 |
| TYPE 2 (N= 6) 4 | 4 | Female | 23 | Paramedicine | 0.4622 |
| | 6 | Male | 24 | Paramedicine | 1.1525 |
| | 8 | Female | 23 | Paramedicine | 1.2782 |
| | 9 | Male | 23 | Paramedicine | 1.9785 |
| | 11 | Female | 23 | Paramedicine | 1.0006 |
| | 15 | Male | 25 | Paramedicine | 0.7815 |
| TYPE 3 (N= 6) 1 | 1 | Female | 23 | Paramedicine | 1.2644 |
| | 3 | Male | 24 | Paramedicine | 0.5375 |
| | 7 | Female | 23 | Paramedicine | 0.7138 |
| | 14 | Female | 23 | Paramedicine | 0.8448 |
| | 16 | Male | 25 | Paramedicine | 0.4434 |
| | 19 | Male | 25 | Paramedicine | 0.6765 |
| TYPE4 (N= 2) 1 | 13 | Female | 23 | Paramedicine | 0.4928 |
| | 17 | Male | 25 | Paramedicine | 5.7690 |

3.1. Type analysis and Discussion

(1) Type 1 (N=7) 3: Education-training & communication-strategy Type

Type 1, as shown in Table 5, had 3 respondents with a factor weight exceeding 1, with the highest positive agreement on Q statement 1 and the highest negative agreement on Q statement 25. Type 1 placed much greater emphasis on 'training and communication' and actively agreed with this.

Table 5.Statements with a standard score of ± 1.00 or higher in type 1.

| Q Statement | | Standard score |
|-------------|--|----------------|
| Positive | 1. Public service announcements require practical training and practice to prepare citizens for real-life situations | 1.97 |
| | 4. Strictly limit public service announcements that involve excessive packaging. | 1.53 |
| | 3. Create public service announcements that foster empathy and communication | 1.32 |
| | 7. Practical guideline public service announcements are needed. | 1.14 |
| Negative | 21. Public service announcements that help with effective evacuation need to be well-prepared in advance. | -1.03 |
| | 23. Public service announcements should include reporting to 119 or 112 and requesting help for evacuation. | -1.21 |
| | 22. Create public service announcements that encourage the use of stairs, not elevators, in case of a crisis inside a building. | -1.27 |
| | 8. There is a need to create public service announcements that are suitable for effective evacuation in the era of AI and Chat GPT. | -1.46 |
| | 24. Public service announcements that encourage effective evacuation inform those around you of the situation. | -1.63 |
| | 25. Public service announcements that encourage effective evacuation are designed to help citizens make good use of media information. | -1.72 |

Note: (* The statements and Z-scores are the highest scores(± 1) in type 1.).

(2) Type 2 (N=6) 4: Advance preparations Type

As shown in [Table 6], Type 2 had 4 respondents with a factor weight exceeding 1, with the highest positive agreement on Q statement 6 and the highest negative agreement on Q statement 18. Type 2 emphasizes proactive training and practice, focusing on 'prevention and preparation' for the general public.

Table 6.Statements with a standard score of ± 1.00 or higher in type 2.

| Q Statement | | Standard score |
|-------------|---|----------------|
| Positive | 6. Public service announcements should include information on immediately informing those nearby and contacting disaster response teams and the fire department in case of a crisis.. | 2.10 |
| | 21. Public service announcements that help with effective evacuation need to be well-prepared in advance. | 1.31 |
| | 13. Public service announcements present proper solutions through social and cultural consensus. | 1.09 |
| | 1.. Public service announcements require practical training and practice to prepare citizens for real-life situations. | 1.08 |
| Negative | 10. Public service announcements make good use of evacuation sites inside and outside buildings. | -1.06 |
| | 9. It is urgent to address the issues of existing public service announcements. | -1.56 |
| | 17. Public service announcements need to include content that encourages calm behavior in urgent situations. | -1.88 |
| | 18. The production of public service announcements requires deep reflection from the creators. | -2.20 |

Note: (* The statements and Z-scores are the highest scores(± 1) in type 2.)

(3) Type 3 (N=6) 1: Media information use & active practice Type

As shown in [Table 7], Type 3 had 1 respondent with a factor weight exceeding 1, with the highest positive agreement on Q statement 25 and the highest negative agreement on Q statement 8. Type 3 respondents place importance on 'information utilization and practice,' emphasizing the need for proactive practice in utilizing information.

Table 7.Statements with a standard score of ± 1.00 or higher in type 3

| Q statement | Standard score |
|-------------|---|
| Positive | 25. Public service announcements that encourage effective evacuation are designed to help citizens make good use of media information. 1.72 |
| | 18. The production of public service announcements requires deep reflection from the creators 1.37 |
| | 1. Public service announcements require practical training and practice to prepare citizens for real-life situations. 1.33 |
| | 21. Public service announcements that help with effective evacuation need to be well-prepared in advance. 1.02 |
| Negative | 15. Public service announcements inform citizens of the seriousness through emergency disaster texts. -1.09 |
| | 5. Public service announcements focus on practicality for SNS users. -1.24 |
| | 8. There is a need to create public service announcements that are suitable for effective evacuation in the era of AI and Chat GPT. -3.13 |

Note: (* The statements and Z-scores are the highest scores (± 1) in type 3.)

(4) Type 4 (N=4) 1: Report & media information use Type

Table 8.Statements with a standard score of ± 1.00 or higher in type 4

| Q statement | Standard score |
|-------------|--|
| Positive | 23. Public service announcements should include reporting to 119 or 112 and requesting help for evacuation. 1.95 |
| | 25. Public service announcements that encourage effective evacuation are designed to help citizens make good use of media information. 1.51 |
| | 24. Public service announcements that encourage effective evacuation those around you of the situation. 1.42 |
| | 20. Public service announcements should be designed to enable quick evacuation through emergency exits. 1.10 |
| Negative | 4. Strictly limit public service announcements that involve excessive packaging. -1.02 |
| | 6. Public service announcements should include information on immediately informing those nearby and contacting disaster response teams and the fire department in case of a crisis. -1.02 |
| | 7. Practical guideline public service announcements are needed. -1.38 |
| | 2. Public service announcements encourage following the instructions of safety personnel. -1.47 |
| | 1. Public service announcements require practical training and practice to prepare citizens for real-life situations. -2.12 |

Note: * The statements and Z-scores are the highest scores (± 1) in type 3.).

As shown in [Table 8], Type 4 had 1 respondent with a factor weight exceeding 1, with the highest positive agreement on Q statement 23 and the highest negative agreement on Q statement 1. Type 4 respondents actively agreed on 'reporting and information utilization.'

In [Table 9], respondents showed exact agreement with the statement (14) that they most positively agreed with. For the other positively agreed statements (11, 16), they showed favorable agreement related to the topic. In statement 14, respondents agreed on the necessity of 'ethical regulation guidelines' in everyday life in the post-COVID environment (statement 14), as well as on the need for a quick initial preparation strategy (statement 11) and the importance of securing media or platform channels online, as indicated in statement 16.

Table 9.
Consensus Q-statements & average Z-scores of each type

| Item Description | Average Z-Score |
|--|-----------------|
| 14. Ethical regulatory guidelines are needed for the production of public service announcements. | 0.31 |
| 11. Public service announcements require swift initial actions. | 0.07 |
| 16. Public service announcements consider various online platform channels. | 0.07 |

Note: * CRITERION = ± 1.000 .

4. Conclusion

The content derived from analyzing the survey using the QUANL program revealed a total of four types. The following four improved public advertising strategies are proposed:

First, provide specific guidelines for effective evacuation during a crisis. It is essential to establish a standard manual that can respond to urgent disasters. A detailed explanation of various situations in preparation for dangerous times should be included in the basic procedures.

Second, a new safety norm system should be established concerning shelter spaces. It is worth considering designating general facilities other than public institutions as shelters during emergencies or constructing facilities that can assist in evacuation and movement.

Third, it is necessary to distinguish shelters based on the evacuation period. Operating temporary shelters for short stays during a crisis and establishing a system that can be quickly utilized in difficult situations is crucial.

Fourth, public relations strategies for active improvement concerning 'effective evacuation during a crisis' should be prepared. There should be sufficient promotional strategies and tactics that can be immediately utilized during a disaster.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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