

A Study on Flight Safety Education Training of Cabin Crew Using IPA

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Abstract

The study seeks to provide useful theoretical data in determining the priority in safety education training of airline cabin crew and develop efficient training methods. A total of 300 copies were distributed using paper format and social media, among which 280 were retrieved. Excluding those with insufficient responses, a total of 236 copies were used for statistical analysis. The empirical analysis was performed using PASW STATISTICS 22.0 and EXCEL. Frequency analysis was conducted to confirm demographic characteristics. To identify differences in importance and performance, paired sample T-test was conducted.

The first quadrant, concentrate here area, is the area where performance consciousness is lower than importance consciousness, and is shown as 'door operation'. That is, it is the area which needs improvement in safety education training, implying intensive management and operation. The second quadrant, keep up the good work area, is the area where both importance consciousness and performance consciousness are high. 'Post-accident procedure', 'before take-off landing procedure', 'turbulence procedure', 'ditching', 'internal structure of aircraft', 'in-flight security', 'first aid and medical equipment' and 'structure of aircraft type' etc. take up this area. The third quadrant, low rank area, is the area where both importance consciousness and performance consciousness are low. 'Regulations

and guidelines', 'external structure of aircraft', 'pre-flight safety work', 'safety during flight', 'cabin decompression' and 'emergency escape' etc. belong to this area. The forth quadrant, the area where we should avoid excessive efforts, is the area where, though importance consciousness is low, performance consciousness is high. It consists of items like 'pre-flight briefing', 'smoke and fire' and 'safety demonstration'.

Key Words : Flight Safety Education Training, Cabin Crew, Importance-Performance Analysis, Airline Service, Paired sample T-test

1 INTRODUCTION

Safety in the airline industry has been considered an important element that can win the airline company credibility from consumers. In the airline industry, the accident rate is low but whatever accidents occur have a tendency to be of a major scale leading to many casualties and a tarnish to the image of the airline company and the country it is from. Safety facilities to ensure the survival of passengers and improve safety on board made remarkable progress due to progress in cutting edge technology. International organizations and government authorities are making efforts to reduce safety incidents. But as the airline market and the demand for air travel grow, reducing further the increase rate of accidents would be a major issue for the airline industry.

Currently, there are two major airlines and a total of six low cost airlines in Korea. T'way Airlines, a low cost airline launched in 2005 was followed by Jeju Air, Jin Air, Air Busan, Eastar Jet and Air Seoul. As of late 2016, T'way and Eastar Jet had a capital erosion rate of 106% and 157%, respectively (Newstomato, 2017). Capital erosion rate refers to the degree that the corporation's equity has run out. This is directly associated with safety issues. Among the most horrific airline accidents of recent years involving a Korea-based airline is the Asiana Airline incident that occurred in July, 2013 at San Francisco Airport. It led three deaths and 187 injured victims (Yonhapnews, 2017). But thanks to the proactive response by the head cabin manager and the dedicated efforts of cabin crew, the number of victims was minimized. As such, the

incident is considered one of the best cases in airline safety incident response. Foreign-based Airlines, too have been undergoing various incidents due to defects in the aircraft or insufficient services. This has led to active research by ICAO and other associations to recognize the importance of the human-related factors as a major cause of airline accidents. As the awareness of the importance of human resources grows, corporations are investing huge amounts of money into human resource training.

Training programs for airline cabin crew are categorized into new recruitment training, existing crew training and regular training in case of Korean Air and Asiana Airlines in Korea. Among the training programs, what is required for the basic tasks of cabin crew is included in the new recruitment training which is conducted over a longer period in a systematic manner to establish the basic attitude and service mindset for the crew. Korean Air dedicates 645 hours to new recruitment training, while Asiana Airlines puts in 528 hours(Koreanair, 2017; Flyasiana, 2017). The new recruitment training program consists of 8 large themes, which are process training on airlines, basic attitude, safety, service theory, service practice, foreign language, customer satisfaction and cabin announcement broadcasting(Koreanair, 2017). Among these themes, safety is further categorized into 18 sub-topics. These are aircraft type, security, emergency equipment, reduced air pressure in the cabin, DGR, emergency escape process, fire-fighting process, safety training manual of the cabin crew, flight theory, crisis response, safety demonstration to passengers, flight information, familiarization with the manual, regulations and guidelines, emergency escape process, aircraft structure, system and door operation(Koreanair, 2017; Flyasiana, 2017).

Meanwhile, the IPA(Importance-Performance Analysis: IPA) method has long been applied by social science researchers as a measure to evaluate the importance of certain traits and the actual performance(Akatas et al., 2007; Hammit et al., 1996). IP analysis is a simple yet effective method to evaluate customer satisfaction. It is used to develop marketing strategies in order to gain competitive edge in the market and also plays an important role in setting priorities that must be adhered to by the corporation. The first case of applying IP(Importance-Performance) analysis to business management was to evaluate the importance of services in automobiles

and the performance levels(Martilla and James, 1977). Since then, IPA has been used to identify important factors in various fields such as marketing, education, sports, psychology, tourism, convention, leisure, service quality and compare performance results. The weakness of IPA is often cited as not having a clear difference between the concept of importance and expectation. Also, it measures not the relative importance compared to competitors but the absolute perception of a given company(Hammit et al., 1996). However, it is still used widely as it allows the researcher to easily identify areas that need priority investment and areas that can be put on hold for investment, leading to maximized satisfaction with a finite amount of resources.

IP analysis enables the easy conclusion of results by using a matrix, as long as the mean value of the evaluation trait is calculated. To set the grid in order to draw the matrix of importance and performance, the mean of importance and performance, the median value, or standard deviation can be used. Most commonly, the mean value is used(Duck and Persia, 1996). The four quadrants can be divided as below with the reference point after placing the performance mean of variables on the X axis and the average of importance of variables on the Y axis. The four quadrants can be interpreted as follows(Martilla and James, 1977; Griffin and Edwards, 2012). The first quadrant has high importance but low performance and can be referred to as a "concentrate here" area. Consumers recognize the importance but think the performance is low. This is an area that requires intensive investment to increase satisfaction with products or services. The second quadrant has high importance and high performance. It is referred to as the "keep up the good work" area. These are cases where the current services or products are highly competitive. In such a case, consistent efforts are needed to maintain this competitive edge. The third quadrant has a low importance and low performance. It is called the "low priority" area and has a less need for additional resource allocation. In this case, investment is decided based on whether there are available resources, but there is no urgent need for it. The fourth quadrant has low importance but high performance. It can be called "possible overkill" area. In this case, efforts poured into these areas need to be diverted elsewhere. That is, excessive investment has been made on traits that are not important

in gaining an edge.

There have been limited researches on safety education training programs targeting airline cabin crew. What proved to be important in existing researches are work-related knowledge, basic mind-set and attitude, and safety and security of crew members, grasping of customer psychology, customer satisfaction, image making, and service practices, etc(Sultan and Simpson, 2000; Tsaur et al., 2002). Though it is important to train cabin crew on how to serve customers in making passengers loyal customers, it is also very important to train them on safety to strengthen safety consciousness of crew members and safe flying of customers. Korean airlines provide cabin crew members with safety education through job training for new employees and reeducation. This study identified the items that are considered important in the safety training of cabin crew and sought to apply IP (Importance-Performance) analysis. The study seeks to provide useful theoretical data in determining the priority in safety education training of cabin crew and develop efficient training methods.

2 DATA COLLECTION AND ANALYSIS

A. Data Collection

For empirical analysis in this study, subjects were chosen from airline cabin crew at two large airlines based in Korea, who had completed new recruitment training and regular safety training. The survey was conducted using a questionnaire distributed for four weeks from January 13, 2017, to respondents who had been explained the purpose of the study. A total of 300 copies were distributed using paper format and social media, among which 280 were retrieved. Excluding those with insufficient responses, a total of 236 copies were used for statistical analysis. The empirical analysis was performed using PASW STATISTICS 22.0 and EXCEL program. Frequency analysis was conducted to confirm demographic characteristics. To identify differences in importance and performance, paired sample T-test was conducted.

3 RESULTS

A. General characteristics of survey respondents

General characteristics of survey respondents are shown in Table I. Due to the characteristics of cabin crew, most of them were females (87.3%), with males being a minority (12.7%). In marital status, those who were not married (55.1%) were more than those who were married (44.9%). The proportion of those belonging to the Korean Airlines was 42%, while that of those in Asiana Airlines was 58%, the larger one. In age distribution, the largest group was those in 20s 47.0%, followed by those of 30s (28.8%), those of 40s (22.1%), and those of 50s and above (2.1%) in descending order. Distribution in education levels was as follows: technical college graduates (7.2%), university graduates (85.6%), and graduate school graduates 7.2%. Most of them were found to be university graduates. In working years, the largest group was those who worked less than 4 years(41.9%). In job positions, cabin crew took up the majority (78.0%).

TABLE I
GENERAL CHARACTERISTICS

Distinction		Frequency	Percentage
Gender	Female	206	87.3
	Male	30	12.7
Airlines	Korean airlines	99	42.0
	Asiana airlines	137	58.0
Marital status	Married	106	44.9
	Single	130	55.1
Age	20-29	111	47.0
	30-39	68	28.8

	40-49	52	22.1
	50 and above	5	2.1
Education	Technical college graduates	17	7.2
	University graduates	202	85.6
	Graduate school graduates	17	7.2
Position	Cabin crew	184	78.0
	Vice manager	18	7.6
	Manager	32	13.6
	Chief manager	2	0.8
Employment Period	Less than 4 years	99	41.9
	4-8 years	40	16.9
	8-12 years	36	15.3
	12 and above	61	25.8
Total		236	100

B. Reliability and validity tests of measurement scales

Generally, validity of measurement scale is related with whether the scale well reflects the reality to measure, and reliability is related with whether related items have internal consistency. To test reliability, this study used Cronbach's alpha which is used to identify internal consistency. Reliability coefficients on importance and performance about safety education training were .902 and .923 respectively, very high scores. Both scores are much higher than .6, the critical point in testing reliability (Nunnally, 1978). Meanwhile, to test validity of the scale, factor analysis was conducted. To extract factors, principle component analysis was done. Varimax rotation was adopted in this study, because it makes the relation-

ship between variables and a factor clear, and easy to understand. Variables whose eigen values are over 1.0 were included in the same factor. Coefficients used to judge fit of the model, KMO coefficient was 0.813, and Bartlett's test was 1507.403($p < .001$). Accumulate explanatory power of variance was 77.812%, showing that there would be no problem in the future analysis. Through exploratory factor analysis, safety education training is composed of four factors.

C. Descriptive statistics on safety education training and difference test

To calculate average scores of importance and performance about safety education training among respondents, and analyze items of them, this study did paired t-test. The descriptive statistics and results of paired t-test on 18 questions regarding importance and performance of safety training are shown in Table II. All the items about safety education training had statistically significant differences at the $p < .05$ level.

TABLE II
DESCRIPTIVE STATISTICS AND DIFFERENCE VERIFICATION

Item	Importance			Performance			t(p)
	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	
Pre-flight briefing	3.669	0.733	18	4.131	0.904	2	7.494(.000)**
Post-accident procedure	4.648	0.781	5	3.941	0.911	9	11.991(.000)**
Before take-off landing procedure	4.504	0.644	9	4.013	0.717	6	8.125(.000)**
Turbulence procedure	4.61	0.961	6	3.911	0.773	11	9.846(.000)**
Regulations and Guidelines	4.263	0.707	14	3.606	0.882	15	9.064(.000)**
Ditching	4.712	0.764	3	4.093	0.903	4	10.992(.000)**
Internal structure of aircraft	4.61	0.881	6	4.013	0.871	6	8.781(.000)**
External structure of aircraft	4.284	0.778	11	3.64	0.901	14	8.425(.000)**
Pre-flight safety work	4.275	0.962	12	3.487	0.837	18	9.113(.000)**
Safety during flight	4.123	0.847	16	3.576	0.894	16	10.354(.000)**

Cabin decompression	4.14	0.705	17	3.555	0.774	17	7.441(.000)**
Emergency escape	4.369	0.866	10	3.691	0.897	13	9.770(.000)**
In-flight security	4.661	0.844	4	4.144	0.763	1	9.126(.000)**
First aid and medical equipment	4.716	0.861	2	4.114	0.779	3	8.228(.000)**
Structure of aircraft type	4.725	0.617	1	4.021	0.831	5	10.058(.000)**
Door operation	4.551	0.909	8	3.847	0.894	12	10.249(.000)**
Smoke and fire	4.267	0.971	13	3.992	0.871	8	4.382(.000)**
Safety demonstration	4.233	0.911	15	3.919	0.805	10	5.718(.000)**

D. Importance-Performance analysis

All the items about safety education training had statistically significant differences at the $p < .05$ level. Based on above findings, the importance consciousness and performance consciousness analyses were applied to suggest ideas of practical management on safety education training of cabin crew. X axis of the IP analytic lattice uses the average of performance consciousness 3.872, and Y axis uses that of importance consciousness 4.409, and it was divided into quadrants, as shown in Figure I.

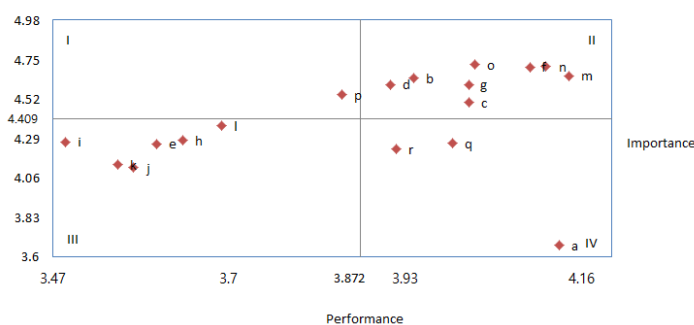


Figure 1: IP Matrix

The first quadrant, concentrate here area, is the area where performance consciousness is lower than importance consciousness,

and is shown as 'door operation'. It is the area where, while cabin crew is conscious of its importance, they are not very satisfied. That is, it is the area which needs improvement in safety education training, implying intensive management and operation. The second quadrant, keep up the good work area, is the area where both importance consciousness and performance consciousness are high. 'Post-accident procedure', 'before take-off landing procedure', 'turbulence procedure', 'ditching', 'internal structure of aircraft', 'in-flight security', 'first aid and medical equipment' and structure of aircraft type etc. take up this area. The third quadrant, low rank area, is the area where both importance consciousness and performance consciousness are low. 'Regulations and guidelines', 'external structure of aircraft', 'pre-flight safety work', 'safety during flight', 'cabin decompression' and 'emergency escape' etc. belong to this area. As those items are what respondents do not put importance on, it is not necessary to invest resources in safety training. But, as we cannot exclude the possibility that importance consciousness can go up in the future, we should pay continuous attention to them. The forth quadrant, the area where we should avoid excessive efforts, is the area where, though importance consciousness is low, performance consciousness is high. It consists of items like 'pre-flight briefing', 'smoke and fire' and 'safety demonstration'. The findings of the analysis of importance consciousness and performance consciousness are shown in Tale III.

TABLE III
IMPORTANCE-PERFORMANCE ANALYSIS

Quadrant	Item
I. Concentrate here	p. Door operation
II. Keep up the good work	b. Post-accident procedure c. Before take-off landing procedure d. Turbulence procedure f. Ditching g. Internal structure of aircraft m. In-flight security n. First aid and medical equipment o. Structure of aircraft type

III. Low priority	e. Regulations and guidelines
	h. External structure of aircraft
	i. Pre-flight safety work
	j. Safety during flight
	k. Cabin decompression
IV. Possible overkill	l. Emergency escape
	a. Pre-flight briefing
	q. Smoke and fire
	r. Safety demonstration

4 CONCLUSION

This study tried to examine priorities in safety education training given to the cabin crew of airlines, and importance and performance conceived by them, by applying IPA techniques in various ways. Through theoretical examination, this study extracted factors on safety education training, and the sample was composed of crew members of two major airlines in Korea who received work training as new employees and periodic safety training. Based on the analytical findings, this study has come to the following conclusions and suggestions.

First, factor analysis based on theoretical considerations led to the four factors: flight safety procedure (pre-flight briefing, post-accident procedure, before take-off landing procedure, turbulence procedure, regulations and guidelines); aircraft structure (external structure of aircraft, internal structure of aircraft, door operation, structure of aircraft type); safety works (pre-flight safety work, safety during flight, safety demonstration, in-flight security); emergency equipment (ditching, cabin decompression, emergency escape, first aid and medical equipment, smoke and fire).

Second, this study conducted paired t-test between importance and performance on safety education training, and found that all the items have significant differences. What crew members regard as the most important is 'structure of aircraft type', followed by 'first aid and medical equipment', 'ditching', 'in-flight security', and 'post-accident procedure', etc. In contrast, what they perceived as being performed the highest is 'in-flight security', followed by 'pre-flight briefing', 'first aid and medical equipment', 'ditching' and 'structure of aircraft type', etc. Meanwhile, the items respondents regard as being performed in low levels are 'pre-flight safety works', 'cabin decompression', 'safety during flight', and 'regulations and

guidelines', etc. Such findings show that, given that various kinds of aircraft whose structures are different are in operation in airlines, crew members are conscious of the importance of education about them. And, they are conscious of the importance of emergency treatment education on emergency patients and knowing how to use medical equipment. In the performance aspect, given the global threat of terrorist attacks, respondents are satisfied with in-flight security, and with cabin briefing before flight.

Third, the IP analysis on safety education training revealed that the first quadrant, concentrate here area had 'door operation'. The area is where, while importance consciousness is high, performance consciousness is low. It implies that it should be improved immediately during safety education training, and it is necessary to make intensive management and operation. Unlike the time before when some airlines used only aircraft manufactured by a specific aircraft, they now operate various kinds of aircraft. Thus, it is necessary to educate cabin crew thoroughly on the procedures of operating doors to make them well-versed in them. If one wrongly opens aircraft door, emergency escape slide bursts open, which influences not only the related flight, but the flight connected with it, giving passengers inconvenience, and causing a large cost to repair the problems. In addition, door operation is an important part directly related with lives of passengers. Thus, it is necessary to do intensive improvement in the education process.

The second quadrant, keep up the good work area, contains items such as 'post-accident procedure', 'before take-off landing procedure', 'turbulence procedure', 'ditching', 'internal structure of aircraft', 'in-flight security', 'first aid and medical equipment' and 'structure of aircraft type', etc. It is the area where respondents consider as highly important and well performed. Cabin crew members are conscious of its importance, and are satisfied with the performance. It is necessary to continue to maintain and strengthen them. The third quadrant, low-ranking area, contains items like 'regulations and guidelines', 'external structure of aircraft', 'pre-flight safety work', 'safety during flight', 'cabin decompression' and 'emergency escape' etc. Cabin crew members regard those items less important, and less satisfied with education. So, it is not necessary to invest resources urgently. However, they need to pay continuous attention to the area. The forth quadrant, the area where

we should avoid excessive efforts, is the area where, though importance consciousness is low, performance consciousness is high. It consists of items like 'pre-flight briefing', 'smoke and fire' and 'safety demonstration'. 'Safety demonstration' given before take-off is being replaced by pre-recorded announcement as aircrafts is upgraded. Thus, respondents seem to regard such education as being excessive. The aviation law requires aircraft to never fail to do safety demonstration to passengers before take-off. Thus, in the case of small aircraft, airlines conduct education to crew members on such demonstration. 'Smoke and fire' is also the area where performance consciousness is higher than importance consciousness, which implies that the efforts and time spent on these two items should divert to other more important items.

The ultimate goal in the airline industry is to improve its corporate image and gain competitive edge in the market with the goal of achieving high quality services and safe flights. Passengers of airlines, too, prioritize service and safety when selecting an airline. This study reaffirmed the necessity of flight safety training for safe operation of aircraft. In addition, we intend to contribute to enhancing the safety consciousness of crews and improving the effective education training through safety education training.

There are some limits to this research. Currently in Korea, there are not only full service carriers, but low cost carriers. The two groups of carriers show differences in various aspects in safety education training in the respect of education environment and education time. Therefore, safety education training for low cost carriers is necessary in the future. In addition, to do deeper researches on safety education training of airlines, it seems necessary to do causal relationship analysis in importance consciousness and performance consciousness, and significant differences among demographic attributes.

References

- [1] Aktas, A., Aksu, A. A., & izel, B., 2007. *Destination choice: an important-satisfaction analysis, Quality & quantity*, 41(2):

265-273.

- [2] Duck, C. R., & Persia, M. A., 1996. *Performance-Importance analysis of escorted your evaluation*, Journal of Travel and Tourism Marketing, 5(3): 207-223.
- [3] Griffin, T., & Edwards, D., 2012. *Importanceperformance analysis as a diagnostic tool for urban destination managers*, Anatolia, 23(1): 32-48.
- [4] Hammit, R. L., Bixler, R. D., & Noe, F. P., 1996. *Going beyond importance-performance analysis to analysis to analyze the observance-influence of park impacts*, Journal of Park Recreation Administration, 14(1): 45-62.
- [5] <http://www.newstomato.com/ReadNews.aspx?no=748791>, 2017.
- [6] <http://www.yonhapnews.co.kr/bulletin/2017/05/17/0200000000AKR20170517109451004.HTML?input=1195m>, 2017.
- [7] *Kr. Koreanair.com/Overview of Korean Air cabin crew trainer's tasks*, 2017. Martilla, J. A., & James, J. C., 1977.
- [8] *Importance-Performance Analysis*, Journal of Marketing, 41(3): 77-79.
- [9] Nunnally, J., 1978. *Psychometric Theory*, New York: McGraw-Hill. Sultan, F., & Simpson, M. C. Jr., 2000.
- [10] *International service variants: Airline passenger expectations and perceptions of service quality*, Journal of Service Marketing, 14(3): 188-216.
- [11] Tsaur, S. H., Chang, T. Y., & Yen, C. H., 2002. *The evaluation of airline service quality by fuzzy MCDM*, Tourism Management, 23: 107-115.
- [12] [www. Flyasiana.com/](http://www.flyasiana.com/) Overview of Asiana airlines cabin crew trainer's tasks, 2017.