CHAPTER 3
RESEARCH METHODOLOGY

The research on a study of consumer acceptance and attitude toward air purifier. Researcher has selected survey methodology by operating under procedures as follows:

3.1 Determining sample size

3.2 Research instrument

3.3 Formulating research instrument

3.4 Data collection

3.5 Data analysis and the statistics used in data analysis

3.1 Determining ample size

The sample of this research is calculated by using Taro Yamane (Yamane, 1973) formula with 95% confidence level. (according 20,693,000 persons from the data of Beijing China district official report 2012.)

The calculation formula of Taro Yamane is presented as follows.

\[ n = \frac{N}{1 + N(e)^2} \]

Where:

\( n \) = sample size required

\( N \) = number of people in the population

\( e \) = allowable error (%)
Substitute numbers in formula:

\[ n = \frac{20,693,000}{1 + 20,693,000(0.05)^2} \]

\[ n = 400 \text{ (Rounded)} \]

After calculated the sample size by substituting the numbers into the Yamane formula, the numbers of sample is 399.992268 persons. In order to obtain reliable of data, researcher has increased sample size to 400 persons.

3.2 Research instrument

For the study, questionnaire is used as the research instrument. The questionnaire consists of 4 parts. The questionnaire consists of open-ended question, check-list question and five point Likert scale and is divided into 4 parts as follows:

PART 1: The first part of the questionnaire is the demographic information of the respondents. Queries about personal information of the sample there are gender, age, education, monthly income, occupation, marital status as check-list questions.

PART 2: The second part of the questionnaire is the questions on consumers' life and environment status. For this part also use check-list questions.

PART 3: In the third part, the questionnaire is the questions on consumers satisfaction with air purifier products. From product packaging, product quality, product price, product services and product promotion to make the questions. Using five point Likert scale with questionnaire.
PART 4: This part of the comments and suggestions.

### 3.3 Formulating research instrument

The questionnaire is formulated through the following steps:

1. Understanding conceptual framework of the study.
2. Brainstorming for questions that will be used in the questionnaire.
3. Classified problems.
4. Selecting the relevant questions and sequencing the questions in order
5. Test the reliability of the questionnaire.

**Result of the reliability testing of questionnaire is as follow:**

The questions in the questionnaire that associated with the different marketing mix factors that influence consumer's preferences and purchasing behavior of air purifier products have the reliability at the level of $\alpha = 0.886$. For the study using SPSS program to interpret the result, if the value of $\alpha$ is more than 0.886 then the questionnaire is acceptable.

### 3.4 Data Collection

The questionnaires were through internet randomly distributed to Chinese people, Metropolitan especially in Beijing city. These areas were selected because these areas are highly crowded and can represent many citizens from the various studying group. Data collection was conducted during in August 2013.
3.5 Data analysis and the statistics used in data analysis

The data of this study will be analyzed by computer through package software (SPSS: Statistical Package for Social Sciences) as follows:

1. The demographic background information of the respondents and the consumers' life and environment status will be analyzed and presented using descriptive statistics in form of Frequency and Percentage.

2. The information of different consumers' satisfaction with air purifier products will be ranged and presented using descriptive statistics in form of Mean () and Standard Deviation (SD).

3. The information of the different life background and environment that influence consumers' satisfaction of air purifier products will be analyzed and presented using compare means statistics in forms of t-test and F-test.

4. The scoring of questionnaire will be analyzed by using five – points rating scale or five – Likert scales.

The five – point Likert scales are as follow:

- Very Satisfied: 5 points
- Satisfied: 4 points
- General: 3 points
- Dissatisfied: 2 points
- Strongly Dissatisfied: 1 point
Researcher used the criteria to scale rating of class interval of Best (1970) to interpret the Mean score of consumers satisfaction with air purifier product in current market.

\[
\text{Class interval} = \frac{\text{Maximum-Minimum}}{\text{Class number}}
\]

1. 1.00 – 1.80 means Strongly Dissatisfied (Not true at all)
2. 1.81 – 2.60 means Dissatisfied (True to a minimal degree)
3. 2.61 – 3.40 means General (True to a moderate degree)
4. 3.41 – 4.20 means Satisfied (True to a high degree)
5. 4.21 – 5.00 means Very Satisfied (Absolutely True)

Statistics used in data analysis

1. Basic statistics

1.1 Percentage

\[
P = \frac{f}{N} * 100\%
\]

Where:

\[
P \quad = \quad \text{Percentage}
\]
\[
f \quad = \quad \text{Frequency to be converted to percentage}
\]
\[
N \quad = \quad \text{Numbers of frequencies}
\]
1.2 Mean

\[ \bar{X} = \frac{\sum x}{N} \]

Where:

\( \bar{X} \) = Mean

\( \sum x \) = Summation of the scores

\( N \) = Numbers of data

1.3 Standard Deviation

\[ SD = \sqrt{\frac{\sum (X_i - \bar{X})^2}{n-1}} \]

Where:

\( SD \) = Standard Deviation

\( n-1 \) = Value of information

\( \bar{X} \) = Mean

\( n \) = Numbers of data
2. Statistical for analyzing the reliability of the questionnaire

Analyzed for the reliability of questionnaire, which set the rating scale by using Cronbach’s Alpha-Coefficient:

\[ \alpha = \frac{n}{n-1} \left( 1 - \frac{\sum V_i}{V_{test}} \right) \]

Where:

- \( \alpha \) = Reliability
- \( n \) = Number of questions in questionnaire
- \( V_i \) = Variability of each of question score
- \( V_{test} \) = Variability of each of overall questions’ score (not %’s) on the entire test

3. Statistical for hypothesis testing

Testing the difference in mean between demographic background and behavior from 7 aspects of marketing mix factors by using t-test and F-test:

\[ t = \frac{\sum D}{\sqrt{ \frac{n \sum D^2 - (\sum D)^2}{(n-1)}}} \]  
\[ \text{df} = n-1 \]
Where:

\[ D = \text{Difference between each data} \]

\[ N = \text{The total of data} \]