Chapter 3

Research Design and Methodology

This chapter is divided into two main parts as followings:

- Research design;
- Research methodology.

3.1 Research Design

3.1.1 Research Plan

This part presents the strategy of research methodology that was used in this study. The study started with a general visual survey as photographic collection observing the physical environment in front of Hue citadel. A pilot study was conducted to scope the photos which are appropriate for the research. Then, process of photographic categorization was carried out base on visual views and environmental characteristics.

After categorization and development of the questionnaire, the study of population was conducted. Preference survey was executed with the participants were chosen. Statistical analysis was applied to obtain the results which answer the questions of the research.

The diagrammatic overview of the research methodology is displayed in Figure 3.1.

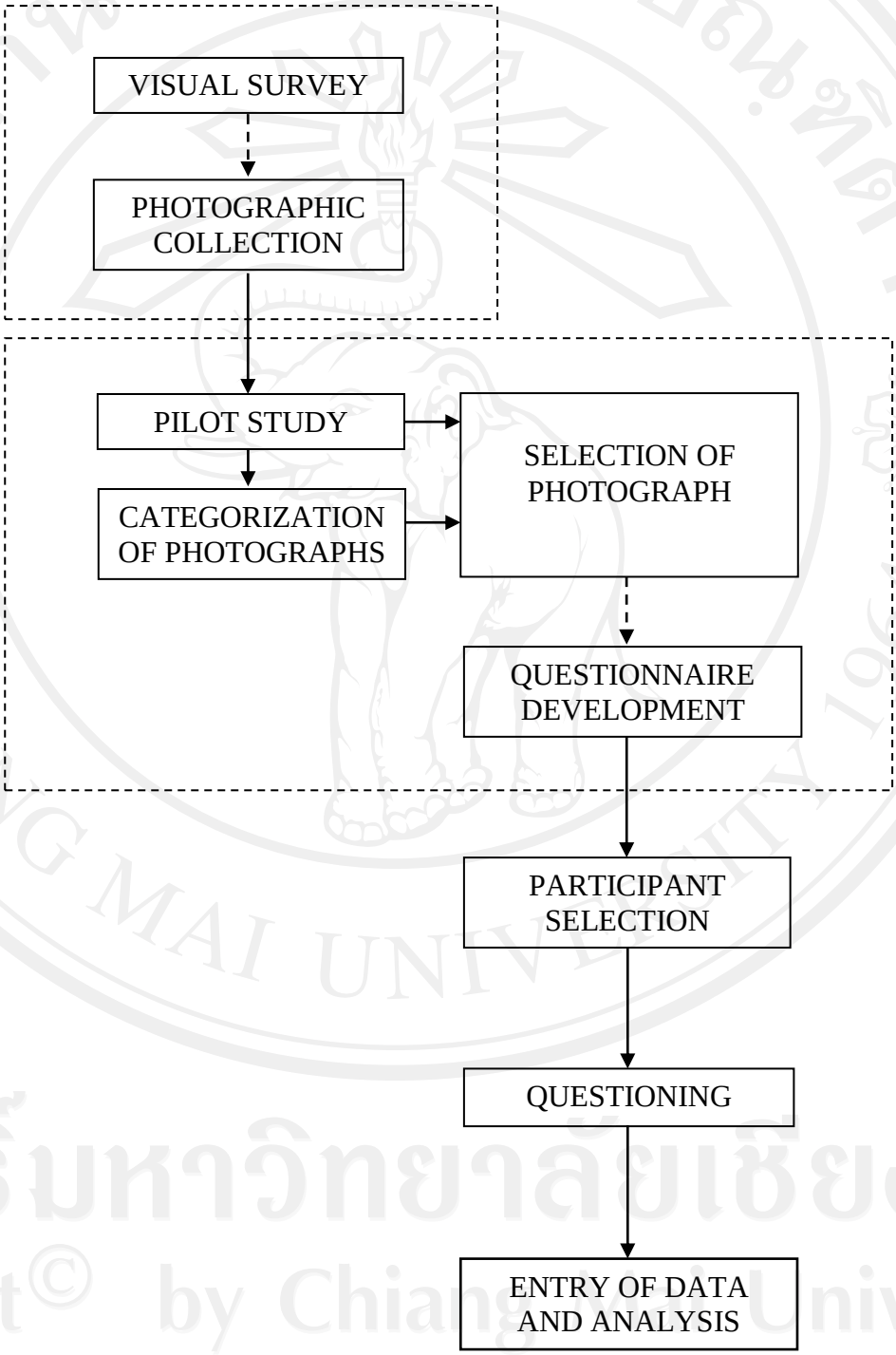


Figure 3.1 Research methodology diagram

3.1.2 Research Topics

Research Topic 1: The Data of Individual Factors

This topic describes the personal characteristics of the participants who joined the survey. This is considered as secondary topic of the research to provide the information of the respondents. However, it also mentions partly the relationship of the experience of participants through familiarity with the images in term of environmental preference.

Research Topic 2: Aesthetic Responses

- *The most aesthetic response:* This topic aims to show the most preference of participants while responding to the environment in front of Hue citadel in term of aesthetics. It further purposes about the environmental features that influence the aesthetic responses.
- *The effective factor with aesthetic responses:* The goals of this topic are finding the effectiveness of factors to the environmental aesthetic response in this study area.

Research Topic 3: Correlations of Aesthetic Response's Factors with Preference

The research topic designs to solve whether the correlation between preference and the other factors of aesthetic response to the environment; and how relationship if it has existences of correlations between them.

3.2 Methodology

Regarding to environmental aesthetics field, environmental evaluation techniques is investigated. New research tools and techniques have been tested and developed during the last 20 years (e.g. Buhyoff et al., 1994; Wherrett, 2000; Perez, 2002; Arriaza et al., 2004; Wong and Domroes, 2005; Rogge et al., 2007) while an inclusive review of studies and approaches to the field was conducted by Lothian (1999). There is a vast and fragmented pool of options when approaching environmental aesthetics. Environmental evaluation techniques can be divided into two main approaches: one based on an objectivist or physical paradigm, the other based on a subjectivist or psychological paradigm (Lothian, 1999; Daniel, 2001). The first group relies upon the opinions and judgments of experts, considering quality as an inherent characteristic of the object viewed and evaluating the landscape through abstract design parameters (Daniel, 2001). The second group relies upon perception-based assessments or ratings from the general public gathered through written and photographic surveys. This group is including the psychophysical, the cognitive or psychological approach, and the experiential or phenomenological approach.

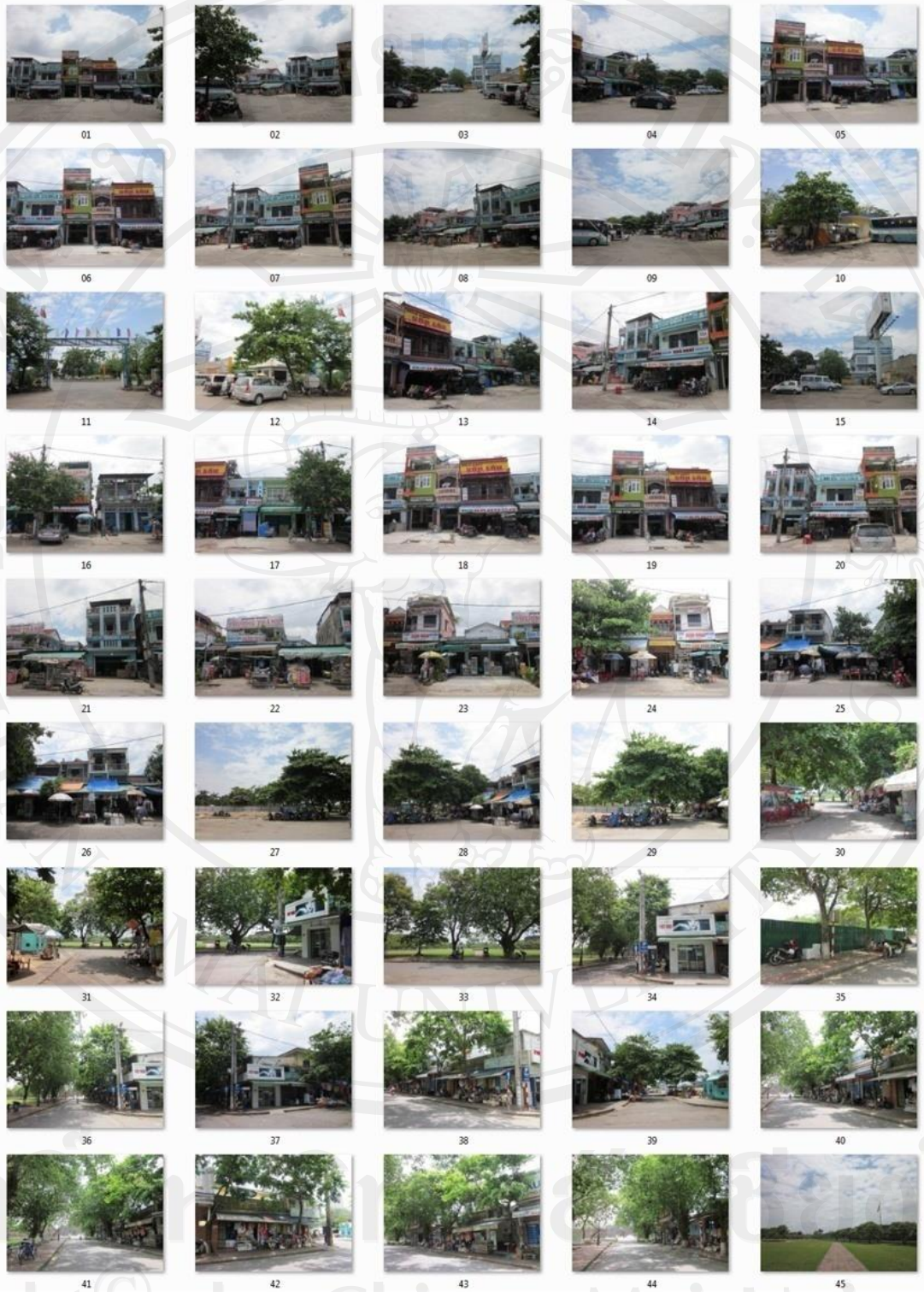
The method employed in this study for the assessment of the urban landscape quality is referred to as psychophysical (the second group). This method achieves a compromise between expert-based and perception-based methods, combining public perception surveys and statistical analysis of the data gathered in order to identify visual components determining the public perception (Schafer et al., 1969; Daniel, 2001; Arriaza et al., 2004). Surveys are utilized to gather public preferences for scenes portrayed in photographs. The use of photographs to elicit scene evaluations has been successfully accomplished and tested by numerous studies, which include the comparison of results of photo-based and on-site ratings (Schafer and Brush,

1977; Schuttleworth, 1980; Law and Zube, 1983; Stewart et al., 1984; Hull and Stewart, 1992; Stamps, 1990; Bernaldez et al., 1998).

Base on the research design that was mentioned above, the methodology of the study was conducted following steps as the strategy of research.

Step 1: Visual Survey and Photographic Collection

This research studies the environment in front of the Hue Citadel in term of aesthetics through evaluating the environment stimuli in this area. The visual survey of environment was carried out as an observation on the area of the route from the tourist parking-lot to the main entrance of the citadel (see Figure 1.3) by digital camera. All photos were captured in a landscape format consistently with previous studies (Hull and Steward, 1992; Wherrett, 2000; Rogge et al., 2007). All pictures were taken at eye level within 180◦ and without any vertical tilting of the camera. The photographic survey was conducted at the same period of day with very similar light conditions (Bernasconi et al., 2008). Pictures were captured along pedestrian paths for various scenes that include the environmental stimuli. Eighty-three photos were taken base on above mentions, which are represented to reflect for the images of the environment in front of Hue citadel and named the series in sequence from 01 to 83. (Figure 3.2)



(a)

(b)

Figure 3.2 Eighty-three photos were captured from the visual survey *(a: photos from 01 to 45; b: photos from 46 to 83)*

Step 2: Selection of Photographs and Questionnaire Development

- *Pilot Study:*

This procedure is executed to narrow the number of photos and prepare for categorization of photos in the next procedure. The pilot study aims to test the preferences of all photos in field of environmental aesthetics, which are taken in the area study (83 photos). Participants of the pilot study were thirty-eight architectural students who are considered as the respondents with partly expert evaluation in this field. The preference of each picture is evaluated through rating the score from 1 to 10 with rating 1 for the least preference and 10 for the most preference as followings (Figure 3.3).

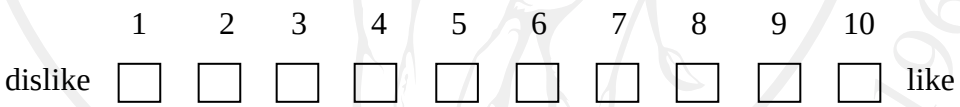


Figure 3.3 Preference scores of each picture in the pilot survey questionnaire

The pilot survey was carried out in a class room with showing the picture by projector. Each slide was shown within 15 seconds and the respondents gave the score of preference on the questionnaire (Appendix A) by themselves. The total scores of the photos order from 97 to 356.

From the results of this pilot study, many photos, which were not consistence with the study, were excepted. Photograph categorization is executed continuously to find out the pictures that represent for the environment in this area to investigate. Besides, the exceptions are also base on their characteristics that didn't reflect the

environmental stimuli. It can be rejected due to the view of perspective is too far or the feature attributes are not clear or enough. For example, the photo below (Figure 3.4) only has sky, greenery, and the yard which are too much percentage of the picture area. The motorbike parking is only temporary feature due to the shadow of the tree; and some other features are not clear.

Figure 3.4 Example of the exception photo

Regarding to the reasons on the former photo, thirty-three photos were reduced to. Then, the selected photos were brought to next process of categorization.

- *Categorization of Photographs:*

The research chose visible physical attributes of scenes, rather than formal features usually used in expert-based approaches or derived perceptual factors which are complexity, focalize, or other cognitive-related attributes (e.g. coherence, mystery) employed in perception-based assessments (Daniel, 2001). The elements present in each image will be identified as picture attributes (i.e. general aesthetic

environmental components of the scenes). The variables chosen will be also based on a review of studies of natural landscapes (McKenzie and Mc Kenzie, 1980; Hammitt et al., 1994; Arriaza et al., 2004; Rogge et al., 2007), and urban landscapes (Anderson and Schroeder, 1983; Horton and Reynolds, 1971; Wong and Domroes, 2005). The importance of separating key visual components of the pictures as feature attributes will be a common feature of all these studies.

Base on above paragraph, categorization of photographic process is conducted due to the feature attributes and observational view of the pictures. The feature attributes of pictures are considered and categorized in the following items:

- *Building;*
- *Tree (greenery);*
- *Temporal shadow;*
- *Parking;*
- *Goods;*
- *Temporal building view point: The observational view was belonging to the point of the camera stood and the direction to view.*

After rejecting thirty-three photos those were not appropriate for the research as mention above, the next procedure was grouping the remaining photos. Selection of photos was base on the feature attributes of environment in each photo. Ten groups of photos are designed as following table, in there, each of group has five photos (see Table 3.1).

Table 3.1 Grouping photos base on feature attributes (environmental stimuli) of the pictures and observational view *(P.S.: Photos selection; F.A.V.: Feature attributes and view)*

Group A	
P.S.	 05 06 07 18 23
F.A.V.	*Building; Zoom (same distance); Elevation*
Group B	
P.S.	 10 12 64 77 79
F.A.V.	*Parking; Tree; Perspective*
Group C	
P.S.	 30 31 32 34 36
F.A.V.	*Building; Tree shadow; Perspective (1 point-tive)*
Group D	
P.S.	 38 40 41 44 54
F.A.V.	*Characteristics of C and goods*

Table 3.1 Grouping photos base on feature attributes (environmental stimuli) of the pictures and observational view *(P.S.: Photos selection; F.A.V.: Feature attributes and view)* (Continued)

Group E	
P.S.	 42 43 46 47 48
F.A.V.	*Similar to D, but focusing to the buildings more*
Group F	
P.S.	 16 17 24 25 26
F.A.V.	*Building; Tree; Elevation*
Group G	
P.S.	 63 65 66 68 73
F.A.V.	*Perspective; No tree*
Group H	
P.S.	 67 70 75 76 78
F.A.V.	*Perspective; Tree*

Table 3.1 Grouping photos base on feature attributes (environmental stimuli) of the pictures and observational view *(P.S.: Photos selection; F.A.V.: Feature attributes and view)* (Continued)

Group I	
P.S.	 14 19 20 21 22
F.A.V.	*Elevation; Building*
Group J	
P.S.	 03 04 09 60 62
F.A.V.	*Parking*

The feature attributes can be divided to two types which are permanent attributes and temporal attributes. These two attributes are different due to the time duration. The temporal attributes are the features that can be changed in short time. For examples, the shadow can be changed due to the sunlight and the building view point can be changed when changing the focus view point.

The feature attributes which are evaluated to permanent attributes are tree, buildings, goods, and parking. The temporal attributes are shadow and building view point.

From the reasons from above paragraph, ten-categorization of photos is considered to re-group into three groups:

G1 is including groups: A, C, D, and I

G2 is including groups: B, F, G, H, and J

G3 is including group: E

- *Selection of Photographs:*

The samples of photos are considered from those three groups (G1, G2, and G3). Number of samples is five photos. Two photos are from G1; two photos are from G2; and one photo is from G3. Each photo has a name due to using in the next procedure. The names are shown as following:

Photo number 22: P1

Photo number 24: P2

Photo number 26: P3

Photo number 42: P4

Photo number 44: P5

Figure 3.5 Photo number 22 is named as P1

Figure 3.6 Photo number 24 is named as P2

Figure 3.7 Photo number 26 is named as P3

Figure 3.8 Photo number 42 is named as P4

Figure 3.9 Photo number 44 is named as P5

- *Questionnaire Development:*

Additionally, instrumentation development was executed. According to O'Conner (2008), ten factors of aesthetic responses have designed to investigate (see Appendix B), those are:

1) Pleasant-unpleasant
2) Beautiful-ugly
3) Exciting-gloomy
4) Stimulating-dull
5) Harmonious-disharmonious
6) Sympathetic-unsympathetic
7) Fits with surroundings-contrasts with surroundings
8) Large-small
9) Dominating-insignificant
10) Like-dislike

Those factors were built base on many previous studies and theories (Heise, 1970; Ward & Russell, 1981; Janssens, 2001; Osgood et al., 1957; Ou et al., 2004; Russell et al., 1981; Russell, 1988; Taft, 1997; Urland, 1997; Wohlwill, 1977; Wohlwill & Harris, 1980). However, this study does not focus to the size judgement, so it can be rejected three relate factors: "fits with surroundings-contrasts with surroundings"; "large-small"; and "dominating-insignificant".

The first questionnaire was designed, in which the main part uses Likert-Scale (Sommer and Sommer, 2002) with seven level of evaluation and seven factors of aesthetic responses as following (Appendix C):

(See Figure 3.10)

Figure 3.10 Preference evaluation form for each photograph in the first questionnaire

The first set of questionnaire was contributed. P1-P5 were colourly printed by "4x6". The researcher brought P1-P5 to participants to evaluate. The results from questionnaires gave invalidation with significant of seven scales is too discriminative. The questionnaire was continued to develop to five scales and excepted the negative words of seven factors:

(See Figure 3.11)

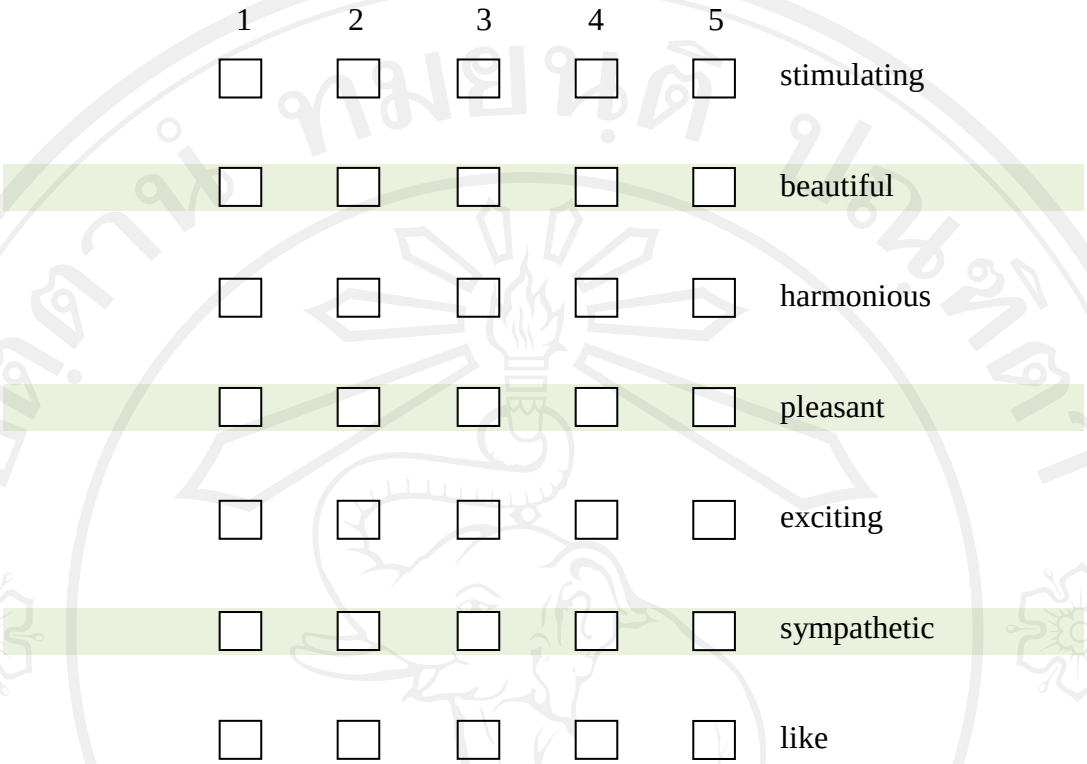


Figure 3.11 Preference evaluation form for each photograph in the last questionnaire

In the questionnaire, descriptions about the study are summarized and the individual characteristics also have mentioned. (Appendix D)

Step 3: Participant Selection

- *Population groups:*

Aesthetic response to the environment can be realized by many groups of people. Firstly, it should be mentioned with the expert groups which are designers (Lynch, 1960; Rapoport, 1976). Secondly, another group is included the residents who live in the area that the environment is being studied. In the research, the

environment was studied at the site as a famous destination for tourists, so the objective perceptions of the group as the tourists are focused.

This study selected the group of local architectural students as the expert group for the pilot study and the group of foreigner tourists to investigate. It is impossible with the foreigners who joined as the participants can be people that have been visited at the Hue Citadel or not.

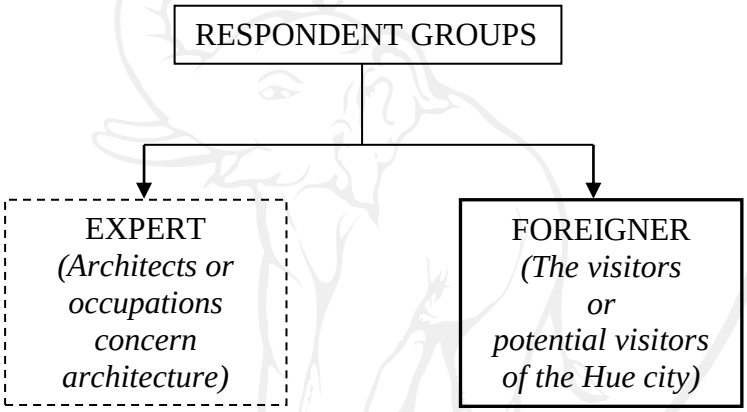


Figure 3.12 Categorization and selection of participant group for study

- Sample size:

According to the formulary of sample size calculation (Yamane, 1967) is following:

$$n = \frac{N}{1 + Ne^2}$$

Where: n: sample size

N: population size

e: the level of precision

Additionally, base on the statistics of the number of international tourists came to visit Hue in 2011 were 883218 tourists (Thua Thien Hue Statistics, 2011). So, the number of participants have calculated were 400 peoples. This research surveyed with 404 participants who come from many countries on the world.

Step 4: Questioning

The main research is interested in the participant group of foreigners. Due to the limitation of time, the procedure of survey was conducted in Chiang Mai, Thailand. Even though, the participants are considered as the foreigners of Vietnam.

The survey with one person normally was not over 15 minutes, so it was consistence with amount of time for obtaining information without tiring the respondent (Zeisel, 1981).

This research chose the places to survey at the public spaces which are ThaPae Gate Square, Three Kings Monument Square, the relax places near the temples or the other tourism destinations, where the participants were in relax and fresh mind to join the survey. The survey has been carried out since 8.00 am till 4.00 pm without rainy days to keep the good natural light to see the photos.

The questionnaire has six papers with the first paper is the information, guidelines, and participant's individual characteristics. After participant completed the first paper, each of five photographs was given with the name correlated with the name of the paper (Appendix D).

The individual characteristics of participants about gender and age were self-reported by participants using the variables: male, female; as well as the following age sub-categories:

a) 18 to 20;

b) 21 to 30;

c) 31 to 40;

d) 41 to 50

e) 51 to 60

f) 61 to 70

f) 71 plus

The survey was conducted with any person who was not the Vietnamese people. Individual differences of participants with respect to country of birth were categorized as follows.

a) Asia

b) Europe

c) North America

d) Africa

e) Oceania

f) South America

Participant selection process has been attended to the participants who are good in English through their reading and understanding the questionnaire.

Step 5: Data Analysis

As the statistical software SPSS 16.0 was to be used for data analysis, an SPSS 16.0 file was created for data input and analysis for this study. The data captured on the questionnaires was input manually by the researcher into the SPSS data file in numbered batches more than a week. After the data input was completed, a check of the data input was conducted to scrutinize for accuracy of data input. This check was

conducted by the researcher with an assistant and involved checking the source documents (questionnaires).

Researchers computed the necessary variables by using "*Compute Variable"* of the software program.

The data analysis processes were carried out following the objectives of the research topics as preceding mentions.

- *Research topic 1: the data of individual factors*

  Use "Frequency" analysis in "Descriptive Statistics" to analyze the data.

- *Research topic 2: aesthetic responses*

  - *The most aesthetic response:* Use "Descriptive" analysis "Descriptive Statistics" to analyze the data.
  - *The effective factor with aesthetic responses:* Use "One-Way ANOVA" analysis in "Compare Means" to analyze the data.

- *Research topic 3: correlations of aesthetic response's factors with preference*

  Use "Correlate" analysis to analyze the data.

The results are obtained in the following chapter.