Chapter 3
METHODOLOGY

3.1. INTRODUCTION

This chapter elucidates the design and methodology through which the research deliverables are established. It offers a blueprint consisting information relating to sampling, data collection method and instruments, and data analysis tools used in this study. Research hypotheses are presented for basic understanding and highlighting their importance to the research objectives. It also throws light on motive behind the inclusion of each of the constructs drawn for the study and its relevance to the objectives. It outlines the procedure involved in the identification of respondents and the criteria for including them in the survey. Designing of research instrument for data collection and the nature of contents are also discussed. In addition, the tools and techniques used for analysis has been explained in the following sections.

3.2. RESEARCH OBJECTIVES

This study is aimed at assessing the visually impaired customers’ (VICs) acceptance of Mobile banking channel as an inclusive banking service. The assessment of Mobile banking acceptance is planned to be studied through a model developed specifically for the visually impaired people.

The major objectives of the study are as follows:

1. Understand the banking pattern of the Visually Impaired Customers (VICs)
2. Study their perception towards the existing inclusive initiatives of the banks
3. Develop a new technology acceptance model (TAM) specifically designed for assessing the visually impaired
4. Assess VICs’ acceptance of Mobile banking as a service channel
5. Identify their preference for the level and form of Mobile banking
3.3. RESEARCH HYPOTHESES

The lists of hypotheses presented here are surmised from the objectives mentioned in the previous section. These hypotheses look to draw meaning into the relationship and association between variables that impact the behavioural outcome. The hypotheses are presented in three parts as each of them caters to different needs of the study. They are hypotheses pertaining to VICs’ banking pattern, assessment of key variables to Mobile banking acceptance, preference for the level and form of Mobile banking.

3.3.1. Hypothesis drawn for studying the banking pattern (Objective 1)

The Hypothesis related to the banking pattern of the VICs will focus on testing the association between various components of banking pattern and their choice of operations.

\( H_{1a} \): There is a significant association between level of impairment and method of operating the bank account by VICs

Nature of operation explains if the account is operated singly or jointly with spouse or even parents. VICs may prefer operating account jointly for security and accessibility reasons as many banks also insist on such operations. \( H_{1a} \) will test the role of nature of account on the number of transactions.

\( H_{1b} \): There is a significant association between level of impairment and VICs’ choice of mode of authorisation (LTI/Signature) to operate the bank account

The study covered respondents with partially impairment as well as customers with full visual impairment. Not many visually impaired customers have the ability to use signature or have a inconsistent signature due to disability, therefore the \( H_{1b} \) will test the role of impairment level of VICs’ in determining the mode the authorisation.

\( H_{1c} \): There is a significant association between mode of authorization (Signature/LTI) used by VICs to operate their bank accounts and the additional features and facilities offered to them by bankers
The provision for offering facilities and features like online banking, ATM card, cheques and so on may vary based on mode of authorisation. $H_{1e}$ will try validating the association between authorisation mode and banking facilities offered

$H_{1d}$: There is a significant association between level of impairment and the additional features and facilities offered to VICs by bankers

The banks may decide to provide features and facilities depending on the severity of the impairment. A bank may decide not to extend few facilities (for example, cheque book facility and ATM access) to blind customers but not so with the partially impaired customers. $H_{1d}$ tries to validate the role of impairment level in features and facilities offered to VICs.

$H_{1e}$: There is a significant association between method of operation (Single/ Joint) and number of transaction done by the VICs (monthly)

Unlike normal customers, visually impaired customers follow two different modes of authorisation for operating their account. The VICs use signature or left thumb impression (LTI) to authorise their account operations. $H_{1e}$ will test if their mode of authorisation depends on their severity of the visual impairment.

$H_{1f}$: There is a significant association between mode of authorisation and number of transactions done by VICs

VICs use LTI or signature for authorising the banking operating, the choice of these modes can well determine the number of transaction, and therefore $H_{1f}$ will throw light on the association between mode of authorisation and the number of transactions done by the VICs.

3.3.2. Variables relating to acceptance of Mobile banking (Objectives 3 and 4)

Though this study involves several hypotheses for testing, the hypotheses presented below can be considered as very critical for the study as they cater to the fundamental aim of this research. These hypotheses revolve around establishing the model developed in this study as well aid in determining those important factors which influence the visually impaired people to adopt Mobile phones for consuming banking services.
A person’s belief on his ability to control the performance to reach the goal is understood as *perceived behavioural control*. Perceived ease of using (PEUMB) is the extent to which an individual believes that using a system (for example, Mobile banking) will take less effort (Davis, 1989). $H_{2a}$ will study the influence of *perceived behavioural control* over Mobile phones on VICs’ perception towards ease of using Mobile phone for banking.

$H_{2b}$: There is a significant relationship between VICs’ perceived behavioural control over Mobile phone usage (PBCM) and the anxiety over using Mobile Banking (ANXMB)

Anxiety is defined as the degree of “an individual’s apprehension, or even fear, when she/he is faced with the possibility of using new technology” by Webster &Martocchio (1992). $H_{2b}$ tests the impact of *perceived behavioural control* on anxiety of VICs on using Mobile phones for banking.

$H_{2c}$: There is a significant relationship between VICs’ perception towards existing banking channel (EXBKCH) used and their perceived usefulness of Mobile banking (PUMB)

*Perception towards existing system* (EXBKCH) (for example, banking channel) is understood as an extent to which the users feel satisfied with the existing system. It was included as a factor for testing the acceptance model through focus group interview. This variable has not been used earlier in any model though its attribute can be found in another construct ‘relative advantage’. Rogers (1995) used *relative advantage* as a key construct to assess technology acceptance. Extent to which the new system will benefit when compared to the old system or technology is *relative advantage*. Though both the variables relate to the comparison of old system with new system, it can be argued that *relative advantage* on new system can be recognised if only the user share a negative perception towards the existing channel. This argument can mark the difference between *relative advantage* and *perception towards existing system* and therefore they can be viewed as two different variables.
 looks to trace the impact of perception towards existing system on the customers’ perceived usefulness of Mobile banking.

There is a significant relationship between VICs’ perceived ease of using Mobile banking channel (PEUMB) and their perceived usefulness of Mobile banking (PUMB)

Perceived usefulness (PUMB) is explained as the degree to which a person believes that using a new system will increase the performance (Davis, 1989). H2d will test if VICs feel Mobile banking is useful because they feel Mobile banking is easy to use. It will highlight the extent to which ease of using a new system can influence the usefulness.

There is a significant relationship between VICs’ perceived ease of using Mobile banking (PEUMB) channel and their attitude towards Mobile banking (ATTMB)

Attitude is an evaluative statement on the system; it can be good or bad. H2e is to test the relationship between perceived ease of using Mobile banking and the attitude of the VICs towards Mobile banking channel. H2e will highlight the importance of ease of using on attitude towards Mobile banking.

There is a significant relationship between anxiety (ANXMB) of VICs over using Mobile banking and their attitude towards Mobile banking (ATTMB)

Testing the impact of perceived anxiety (fear or apprehension of VICs using Mobile phone) on the VICs’ attitude towards using the Mobile phone for banking is performed in H2f.

There is a significant relationship between VICs’ perceived usefulness of Mobile banking (PUMB) and their attitude towards Mobile banking (ATTMB)

This hypothesis considers the importance of VICs’ perception on the usefulness of Mobile banking towards their attitude formation on using Mobile banking.

There is a significant relationship between VICs’ attitude towards Mobile banking (ATTMB) and their intention to use Mobile banking (INTUSEMB)
The influence of VICs’ attitude towards Mobile banking on their intention to use the Mobile banking is hypothesized in H2h. There is a possibility that VICs may show disinterest in spite of a good attitude on Mobile banking and also vice versa.

3.3.3. Demographic factors and preferred level / form of Mobile banking (Objective 5)

\[ H_{3a}: \text{There is a significant association between preferred form of Mobile banking and level of impairment.} \]

The significant association between VICs’ preferred level of Mobile banking and their impairment level will be tested using the Chi-square for examining the hypothesis.

\[ H_{3b}: \text{There is a significant difference in the preferred Mobile banking form of VICs and their demographic characteristics (such as age, education, and occupation)} \]

Banking through Mobile phones may be preferred to be used at three levels, namely information level, interaction level or transaction level. H3b will highlight the differences in the VICs’ preferred level of Mobile banking channel based on their demographic characteristics such as age, education, occupation and impairment level.

\[ H_{3c}: \text{There is a significant association between preferred level of Mobile banking by VICs and their level of impairment} \]

The significant association between VICs’ preferred level of Mobile banking and their impairment level will be tested using the Chi-square for examining the hypothesis.

\[ H_{3d}: \text{There is a significant difference in the preferred Mobile banking level of VICs and their demographic characteristics (such as age, education, and occupation)} \]

Mobile banking in India is currently available in three different forms: SMS-based, Web-based and Application-based. H3d will highlight the differences in the
VICs’ preferred form of Mobile banking based on their demographic characteristics such as age, education, occupation and impairment level.

3.4. RESEARCH DESIGN

The study involved two parts comprising both qualitative as well as quantitative approach.

a. Preliminary Research: An exploratory component was involved during preliminary research as focus group interview was conducted. List of constructs identified through review of literature were offered for discussion to select appropriate variables for model development. This part of the research had a qualitative approach.

b. Main Research: The main study is descriptive in nature. It is a cross-sectional design aimed at assessing the factors determining the VICs acceptance of Mobile banking. It relied on a survey that used a schedule (that is, personally administered questionnaire) comprising three parts covering the banking pattern of VICs, key constructs determining Mobile banking acceptance and the VICs preference on level/form of Mobile banking.

3.5. SOURCE OF DATA

The study, though fundamentally rested on primary data collected through survey and focus group interviews, it also relied on secondary source of data for identification of constructs to be discussed in the focus group and selection of key variables for model development. Literature on new technology acceptance models, extended Technology Acceptance Model (TAM), banking for visually impaired people and Mobile banking were carefully reviewed for understanding to develop a suitable model and research instrument for model validation.

3.6. METHODOLOGY

The study involved both focus group interviews as well as survey using a schedule questionnaire. The preliminary data for the research was acquired through
focus group interviews based on which the main research instrument and model were built for further examination.

3.6.1 Data Collection

The data for the study includes both from primary as well as secondary sources. Though primary data played a critical role in establishing the research objectives, the secondary data in the form of literature (past studies, industry reports and research articles) aided in building up this study towards model development.

A discussion on the data collection tools and the process adopted for data collection for the study follows.

a. Research instrument:

The data for this research was sourced through two methods: focus group interviews and survey using schedule questionnaire.

- **Focus group interview**: Studies suggest that focus group interview is the common tool used for identifying constructs to be used in developing a questionnaire for the study (Anatchkova&Bjorner, 2010). To select appropriate variables to be included in the model for assessing the VICs acceptance of Mobile banking, focus group interview was conducted with visually impaired participants. Since the study involves special group (people with disability) and thus far not researched in this context, it was critical for taking opinion and suggestion while choosing the critical variables from these participants for building the research model. Extended Model for assessing technology acceptance of visually impaired people (EMTA-VIP) was developed with the help focus group interview by presenting the key constructs consolidated through literature review.

- **Schedule**: This study used schedule for collecting data from the visually impaired respondents. There is not much difference between a schedule and questionnaire, only difference is the schedule involves an enumerator who carefully enumerates the questions and then fills in the information on behalf of the respondents (Miller & Brewer, 2003). This study involves respondents with
visual impairment and not many of them were fluent with Braille. Therefore the role of enumerator was very critical in getting the questionnaire competed as they cannot read or fill in the questionnaire. The personally administered questionnaire used as schedule consisted of close-ended questions. The structured questionnaire was seeking information under five sections, out of which four were pertaining to the objectives and the last section sought demographic information as mentioned below.

- Questions were seeking demographic details such as age, occupation, education and impairment level from the respondents. The demographic information will be used for various tests to understand their impact on banking pattern, key variables and preferred level and form of Mobile banking.

- Close-ended questions on *banking pattern of the VICs* form the second section of the questionnaire. Information on the number of bank accounts, authorisation, and nature of account, facilities offered, deposits/credits consumed and transaction were solicited in this section.

- The next component confined to VICs’ perception towards existing inclusive banking initiatives and support.

- The fourth section of the questionnaire was very critical as the key constructs (that is, factors influencing technology acceptance) were offered for rating on a five-point Likert scale. These key constructs were selected by VICs during focus group interview from among the list identified through a review of literature.

- The last section was pertaining to VICs’ preference for the form and level of Mobile banking.

b. Data Collection process:

*Survey:* Informed Survey was done among visually impaired customers. Personally administered questionnaire was presented to the VICs during the gatherings of the members of the associations for visually impaired persons. Schedule was filled in over a one-to-one interaction at the end of the meetings (time and place was prescribed by the association for this purpose) subsequent to

- taking prior permission from the association,
- briefing the VICs about the study and the information solicited and
- obtaining informed consent from the individuals concerned
3.6.2. Duration of the study

The focus group interview for selection of key variable for model development and schedule designing was conducted during March 2013. The data collection via schedule was done from September 2013 to January 2014 in the two districts (namely, Tiruvannamalai and Vellore) of northern Tamilnadu state.

3.6.3. Sampling plan and size

a. Preliminary Study: The focus group interview was adopted for preliminary study. The focus group interview was conducted with two groups of visually impaired teachers and assistant professors. Each discussion involved 10 participants who were facilitated by a moderator. The participants for the focus group were selected using purposive method. The size for focus group was limited to five as it was difficult to control the discussion with higher number due to disability. Every visually impaired participants of the discussion were trying to speak at the same time as they cannot recognise the other person starting to speak due to visual disability which made it difficult to control group of 10 participants and was a also big challenge to draw attention of all the participants, therefore only five participants were considered for each of Focus group discussion. The aim of purposive method is to concentrate on specific characteristics of a population that are of concern, which will best facilitate the research questions. Purposive sampling is considered to be the most suitable and common method used for focus group interview (Miles & Huberman, 1984). Purposive method is understood as selection of participants based on the nature of the study and the participants’ capacity to supply to the research (Miles & Huberman, 1984). The discussion was conducted with more than one group as the Calder’s (1977) basis for conducting focus group interview insists that adopting more than one group for discussion will be more effective and will provide meaningful information. The objective of the focus group interview was to identify the suitable constructs (key variables) from a list of constructs identified from previous studies.

b. Main research: Schedule (that is, an orally administered questionnaire) was used for collecting data from 203 visually impaired respondents (Copy of the
Questionnaire is presented in Appendix I). The respondents for the survey were chosen using appropriate inclusion criteria. Adequate and essential precautions were engaged to shun sample bias with the data collected. The respondents for the survey were identified using purposive snow ball sampling procedure. Snowball sampling is used when sample for the study is very rare or is limited to a very small subgroup of the population. This type of sampling technique works like chain referral (Explorable.com, 2009). David & Morgan (2008) suggested that snowball sampling method should be used when the participants are aware of persons with similar and required attributes that qualify them to be included in the sample. In this study, snowball sampling was adopted since identifying visually impaired people on random basis or casually was impossible due to limitation and the special characteristics of the population. Therefore, the sample for survey was identified through a chain of referral from other participants. The sample was purposefully chosen and accumulated through references of various associations for visually impaired persons.

3.6.4. Inclusion criteria

The research drew inclusion criteria to be adopted while choosing the sample to ensure refining the unit to be studied.

*Inclusion criteria for sample selection:* Salaried people with ‘severe impairment’ (Note: as per WHO directive, people with 10-20 percent vision come under severe impairment) and blind, salaried and having bank account were the criteria used.

- Category of impairment: This study was planned for assessing visually impaired people; but there are large numbers of visually impaired people with different levels of impairment. Even amongst the people with visual disability, there are people who can still lead a normal life and do things like a normal person does with the help of suitable magnifying glasses. As this study looks to aid people who are most affected due to disability, the study had criteria to include people with ‘severe visual impairment’ (based on the WHO factsheet, 2012 classification on impairment levels). This study concentrates on people with severe visual
impairment and blindness, as they cannot read or view image, text, or identify colours even with the help of magnifying glass or any other tool for vision

- **Having Bank account:** Visually impaired population includes customers with bank account as well as unbanked people. Including people without bank account might not help in accuracy of the information to be collected. Therefore including visually impaired people having bank account was another inclusion criterion.

- **Salaried:** Finally, visually impaired people from the salaried class were considered since it is a mandatory requirement for them to have a bank account in order for their monthly salaries to be disbursed. It would not be appropriate to include people without income or irregular income. Besides, considering the salaried class will ensure studying visually impaired people with familiarity on the banking system.

People fulfilling all three criteria mentioned above were considered for the focus group discussion as well as survey.

### 3.6.5. Data analysis and statistical tools

The data was edited and analysed using Statistical Package for Social Science (SPSS 16.0). Pearson’s Chi-square analysis was used to test some of the hypotheses. These tests helped in understanding the association between the banking pattern variables. The descriptive statistical analysis comprising mean, mode and standard deviation was applied for understanding VICs’ perception towards existing banking practices.

Smart PLS, a software application for Partial Least Squares Structural Equation Modelling (PLS-SEM) developed by Ringle (2005) was used for testing EMTA-VIP. The structural model and hypothesis were tested by computing t-value and beta co-efficient output. PLS also offers to verify suitability of model with the hypothesized relationship through the squared multiple correlations ($R^2$) for each related variable in the model. The $R^2$ determines the percent variation of the connecting variables explained by the model (Wixom & Watson, 2001).
One way Analysis of Variance (ANOVA) was used for testing the hypothesis relating to the demographic characteristics of VICs and their preference for level and form of Mobile banking. Post hoc test (using Scheffe’s procedure) was also done to conclude on understanding the differences between the groups.

Table 3.1 highlights the various elements of the methodology adopted in this study.

Table 3.1. Essence of the Research Methodology

<table>
<thead>
<tr>
<th>a. Data collection</th>
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<tr>
<td><strong>Area</strong> - North Tamilnadu state (Vellore and Tiruvannamalai Districts)</td>
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<tr>
<td><strong>Data collection</strong> - During the gatherings of the associations for the visually impaired people; on one-to-one basis at the end of the meetings; at the time and place prescribed by the associations for this purpose</td>
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<tr>
<td><strong>Method and instrument</strong> - Survey was carried out using a schedule (that is, an orally administered questionnaire) to ensure that there are no recording errors or missing data</td>
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<td><strong>Scale</strong> – 5-point Likert scale (‘1 as positive and 5 as negative’)</td>
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<tr>
<th>b. Data collection process</th>
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<tr>
<td><strong>Ethics Committee</strong> - Clearance from the University’s Ethics Committee (Human Studies) Approval no.42/28.02.2013 (Certificate of approval from the Institute of Ethics Committee Human studies, Pondicherry University is shown in Appendix IV)</td>
</tr>
<tr>
<td><strong>Briefing</strong> - The respondents were briefed about the study and the information solicited</td>
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<td><strong>Respondents’ consent</strong> - Obtaining informed consent from the individual respondents</td>
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<th>c. Sampling Plan</th>
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<tr>
<td><strong>Respondents</strong> – Visually impaired persons</td>
</tr>
<tr>
<td><strong>Size and method</strong> – 203 VICs through purposive snowball sampling</td>
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<tr>
<td><strong>Inclusion criteria</strong> - Severe impairment category (as per WHO directive) and blind; Salaried and having a bank account</td>
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<tr>
<th>d. Statistical tools</th>
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<tr>
<td><strong>SPSS 16.0</strong> – Analysis of Variance (ANOVA) and Pearson’s Chi-square</td>
</tr>
<tr>
<td><strong>Smart PLS</strong> – Structural Equation model</td>
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3.6.6. Reliability and validity assessment of the model generated through PLS application

PLS application needs a different method for checking the reliability and the validity of the model as the normal indicators used for assessing models are not suggested for checking structural path model developed using PLS application.

Some of the guidelines suggested on using PLS application are presented in table 3.2. It lists criteria that are not relevant to test PLS output and also presents guidelines on items to be considered for checking reliability and validity for reporting PLS-SEM output.

Table 3.2. Guidelines suggested for testing PLS-SEM

<table>
<thead>
<tr>
<th>Criteria that are not good for testing PLS output</th>
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<tbody>
<tr>
<td>Inner model evaluation (reflective)</td>
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<tr>
<td>Do not use goodness-of-fit (GoF) Index</td>
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<tr>
<td>Henseler &amp; Sarstedt, 2013</td>
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<tr>
<td>Outer model evaluation (formative)</td>
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<tr>
<td>Report indicator weights. To test the outer model’s significance, report ( t )-values, ( p )-values and standard errors.</td>
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<td>Bagozzi &amp; Yi, 1988</td>
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Guidelines for checking and reporting reliability and validity of PLS-SEM output while SmartPLS application is used

<table>
<thead>
<tr>
<th>Components for checking reliability and validity</th>
<th>Criterion measured for checking validity or reliability</th>
<th>Accepted values for establishing reliability or validity</th>
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<tbody>
<tr>
<td><strong>Indicators for checking reliability</strong></td>
<td><strong>“Outer loadings” of the construct items</strong></td>
<td><strong>Acceptable limit is &gt; 0.4</strong> (Hulland, 1999)</td>
</tr>
<tr>
<td><strong>Acceptable limit is &gt; 0.4</strong> (Hulland, 1999)</td>
<td><strong>“Outer loadings” of the construct items</strong></td>
<td><strong>Acceptable limit is &gt; 0.4</strong> (Hulland, 1999)</td>
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<table>
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<tr>
<th><strong>Internal consistency reliability</strong></th>
<th>“composite Reliability” reported in Quality Criteria</th>
<th>&gt;0.6 is acceptable (Bagozzi&amp;Yi, 1988)</th>
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<td><strong>b. Checking validity</strong></td>
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<tr>
<td><strong>Convergent validity</strong></td>
<td>AVE numbers</td>
<td>0.5 or higher is acceptable</td>
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<td></td>
<td></td>
<td>(Bagozzi&amp; Yi, 1988)</td>
</tr>
<tr>
<td><strong>Discriminant validity</strong></td>
<td>AVE numbers of the constructs and the (Latent</td>
<td>The square root of AVE should</td>
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<td></td>
<td>variables) correlations among them</td>
<td>be greater than the correlations</td>
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<td></td>
<td></td>
<td>among the latent variables</td>
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Source: Kwong& Wong (2013)

3.7. PILOT TESTING

The pilot testing of the questionnaire to be used as schedule (that is, personally administered questionnaire) was done with two groups of 10 visually impaired customers comprising both school teachers as well as assistant professors. The pretesting of the content of the questionnaire was done only after prior briefing on the objectives of the study, sampling procedure and also clarifying their role in pretesting.

**GROUP 1:** The first group was offered questionnaire for testing and then feedback and suggestions were requested on the structure of the questionnaire, ordering of the questions, wording, data collection method, scaling of the key constructs, level of impairment to be offered in options, content of the classification data, questions and choices to be presented to study banking pattern and the length of the questions.

**GROUP 2:** The second group was offered the questionnaire after incorporating corrections and suggestions based on the feedback given by the first group. A different set of teachers was chosen in this group to ensure unbiased opinion.
3.8. CONCLUSION

This chapter described the research design and methodology adopted for the study. The study is descriptive in nature and cross-sectional that looks to assess VICs’ acceptance of Mobile banking channel. The study also tries to understand their banking pattern and preference for form and level of Mobile banking. This study used focus group interview for selection of variables from the list summarised through a comprehensive literature review. TAM based model (EMTA-VIP) was developed for assessing the visually impaired customers’ acceptance of visually impaired people. The constructs used in the model were identified through literature review and further screened by focus group interview for suitability. The main study adopted purposive snowball sampling procedure for surveying with the help of schedule. A schedule consisting of four sections, each pertaining to a research objective and one section on demographic information was designed for the study. The research instrument was pretested before the survey. Smart PLS was used for validating the model though structural equation method and the statistical tools such as Chi-square and ANOVA were used to analyse data on SPSS software. Next chapter will offer detailed information on the data analysis and findings from this study.