CHAPTER III
RESEARCH METHODS

3.1 Research Subjects and Objects

The research subject stands as a cornerstone in the landscape of research endeavors. It denotes the core focus of the investigation, representing the individuals, entities, or elements actively involved in the study and forming the nucleus around which the research revolves. Participants in a study are persons who offer to partake in a study. Data is collected information about or from a person that may be utilized to respond to a research question (Scruggs & Mastropieri, 2021). People who participate in scientific studies are referred to as human subjects, study volunteers, and research participants (Scruggs & Mastropieri, 2021). The selection of participants for each study is contingent on their satisfying certain eligibility standards. Depending on the nature of the research, age, behaviour, health, and other criteria may be enforced as restrictions (Creswell & Creswell, 2017). Given the nature of the research, participants were smallholder farmers from the four agriculture-dominated districts in the Ashanti Region, namely Ejura Sekyedumase, Sekyere East, Sekyere Central, and Amansie Central districts. The study used stratified sampling techniques to achieve a fair and scientific representation of the four districts to be sampled.

It is difficult to pinpoint precisely what constitutes a smallholder farmer although the term often refers to individuals who labour with small parcels of land and have difficulty accessing credit for their agriculture business (Abay, Koru, Chamberlin, & Berhane, 2022). Asuming-Brempong, Anarfi, Arthur, and Asante (2013) indicated in Ghana's Poverty and Social Impact Assessments (PSIAs) that smallholders are better characterised by resource diversity and vulnerability than by metrics of land ownership alone. This is because low-income families come in a variety of sizes and forms. As a supplementary case study, they examined the situation in Ghana. A smallholder is a farmer who manages less than five hectares of land in any region of Ghana (Ekboir (Ekboir, Jarvis, Sumner, Bervejillo, & Sutton, 2002). As defined by the Ministry of

Food and Agriculture, 90% of agricultural holdings in Ghana are fewer than two (2) hectares using a distinct metric (Ministry of Food and Agriculture, 2005).

The study utilises the Ministry of Agriculture's (MoFA) definition of smallholder farmers based on land ownership. A farmer is deemed a smallholder under this approach if the total area under cultivation is 2 hectares (4.942 acres) or less. Smallholder farming comprises the vast majority of Ghana's agricultural sector, and the definition of smallholder provided by the Ministry of Agriculture and Cooperatives has historically played a prominent role in the relevant academic literature, this was the most compelling reason for selecting this definition. Smallholder farmers are people who own extremely tiny plots of land and depend almost solely on their labour and the weather to provide for their families. Smallholder farmers' production strategies are characterised by low returns, considerable seasonal labour fluctuations, and the use of basic equipment that has been in use for decades but is now outdated. In addition, they vary in personality qualities, farm size, resource allocation (between food and cash crops, livestock, and non-farm activities), dependence on external inputs and hired labour, market share for produced food crops, and family budgeting practises (Asante-Addo, Mockshell, Zeller, Siddig, & Egyir, 2017).

According to the Ghanaian Ministry of Food and Agriculture, over 70% of agricultural households in Ghana are classed as smallholders. Because the majority of these farmers reside in rural areas, it is difficult for them to use conventional banking and financial services. As a result, 36% of Ghanaian farmers keep their savings in their homes, 20% in banks including MFIs, and 28% in mobile money wallets (Ministry of Food and Agriculture, 2005). Therefore, if smallholder farmers are to participate in the inclusive financial agenda, they must have access to a greater variety of financial services which is facilitated by microfinance digital innovation services to the smallholder farmers.

The research objects play an important function within the domain of research. These items symbolise the primary and pivotal elements that researchers endeavour to examine, comprehend, and scrutinise in their study. Research objects refer to the variables, phenomena, or aspects that undergo thorough inspection, measurement, and

study during the research process. The themes of inquiry, being the fundamental focus of research, are integral to the heart of the research endeavour.

The research objects in the present study are of utmost importance in determining the emphasis and trajectory of the research. These parts function as particular components within the wider study topic, namely the adoption of microfinance digital innovation services in the agriculture sector in Ghana.

The selection and definition of these research items are conducted to accurately reflect the variables being studied. The provided statement encompasses the fundamental aspects and elements of the topic, which span from financial requirements and socioeconomic variables to individuals' intention and use of digital innovations in microfinance services, benefits of microfinance services, socioeconomic factors. These variables serve as both the focal points of methodical examination and the fundamental components for the acquisition, examination of data.

3.2 Research Methods

3.2.1 Methods and types of research used

The study employed a quantitative research method by adopting the explanatory survey research design to examine the adoption of microfinance digital innovation services and its impact on access to benefits of microfinance services (loans, savings and insurance). This approach is suitable because the data received through questionnaires or surveys are analyzed statistically, and numerically, or because the previously collected statistical data is modified using computer tools (Boujelben, van Pelt, & Maalej, 2022). An explanatory survey research design is employed to try to reconstruct an event that has occurred. This might boost the understanding of a subject matter, the capability to explain a phenomenon, and the ability to predict the future (Akinlua & Haan, 2019). The research design may be conceptualised as a "cause and effect" paradigm since it analyses the relationships between several components. Thus, the explanatory survey design is considered a causal analysis (Holbeche, 2019).

Investigating the causes of a phenomenon is the major objective of the explanatory study. This research design is appropriate as the study examines how the

adoption of microfinance digital innovation services influences access to benefits of microfinance services to use microfinance digital innovation services and the use of microfinance digital innovation services as mediating variables. Exploratory survey research design is hence often the first phase in the research process. It provides a foundation for future research by laying the basis for further investigations. The data may be used to form inferences about recurring incidents and to provide light on the direction of future studies. A causal analysis is an inquiry into the potential causes of a connection between two variables. To attain this objective, explanatory research builds upon the foundation laid in the previous step (Contesse, Gage, & Lane, 2021). Its objective is to gather as much knowledge as possible on a certain subject, event, or occurrence (Creswell & Creswell, 2017). In comparison with experimental research design, it is more time-consuming and costly than explanatory research, which is less time-consuming and less expensive (Dannels, 2018).

Quantitative research may measure behaviours, attitudes, and other traits while making conclusions about the whole population. In summary, quantitative research aims to comprehend the relationship between an independent and dependent variable in a population, which this study seeks to achieve (Prior & Mora, 2019). Thus, examine the influence of the financial need of household farmers on the intention and use of MDI services in the agriculture sector of Ghana, ascertain the influence of socioeconomic factors on the intention and use of MDI services in the agriculture sector of Ghana, examine the nexus between the intention of MDI services and the use of MDI services in the agriculture sector of Ghana, examine how the intention and use of MDI services mediate the relationship between the financial need of household farmers and access to loans in the agriculture sector of Ghana and investigate the mediating effect of intention and use of MDI services on the nexus between socioeconomic factors and access to loans in the agriculture sector of Ghana focusing on smallholder farmers in the Ashanti Region.

3.2.2 Operationalization of research variables

Table 3.1 Operationalization of Research Variables

Variables/ Sub Variabless	Concept Variables/ Sub Variabless	Indicators	Measurement	Scale
Benefits of microfinance services (Robert et al., 2021; Selinger, 2008)	Microcredit benefits	Loan Terms and Process Assessment	1. The loan interest is reasonable 2. The loan-obtaining procedure is simple 3. The loan amount is sufficient 4. The loan repayment period is sufficient 5. The loan repayment procedure is easy	Interval
Benefits of microfinance services (Hulme, Moore, & Barrientos, 2009; Maganga, 2021)	Micro savings benefits	Micro savings benefits effectives	1. The savings interest is reasonable 2. The savings product options are attractive 3. The procedures are simple 4. The savings withdrawal is easy	Interval
Benefits of microfinance services (Benami & Carter, 2021; Hulme et al., 2009)	Micro insurance benefits	Micro insurabce benefits performance	1. Insurance benefits are effective 2. The availability of different policies is satisfactory 3. Obtaining an insurance policy is compulsory 4. Insurance policy premiums are reasonable 5. Insurance claims are promptly paid	Interval
The financial need of household farmer (Benami & Carter, 2021; Kono & Takahashi, 2010)	Famers financial need requirements	Farmers financial needs assessment	1. My finance need is to purchase farm inputs (improved seed, fertilizer, agrochemicals) 2. My finance needs to finance working capital 3. My finance need is to purchase agricultural farmland 3. My finance need is to agriculture rent/lease farmland 4. My finance need is to invest in new machinery and equipment 4. My finance need is to invest in modern agriculture technologies (mechanization) 5. My finance need is to invest in research and development of improved seeds	

Variables/ Sub Variabless	Concept Variables/ Sub Variabless	Indicators	Measurement	Scale
			6. Personal consumption (health expenses, school fees, purchase of a personal vehicle	
Intention to use microfinance digital innovation servrces Rouibah et al. (2011), Mbawuni and Nimako (2017)	Perceived Benefits of Microfinance Digital Innovation Service	Digital Finance Benefits Perception	1. I believe using a microfinance digital innovation service will help me manage my finances better. 2. I intend to use a microfinance digital innovation service in the near future. 3. I trust the security of a microfinance digital innovation service to protect my personal information. 3. Using a microfinance digital innovation service will save me time and effort in managing my finances. 4. I believe a microfinance digital innovation service is easy to use and understand. 5. I believe that using a microfinance digital innovation service will give me more control over my financial future. 6. I feel comfortable using technology to manage my finances. 7. I am willing to pay a fee for the convenience of using a microfinance digital innovation service.	Interval
Use of Microfinance Digital Innovation Service (Andersson & Wallgren, 2022; Sam & Deppah, 2009), Basri (2018), Rahmiati et al. (2022)	Usage and Impact of Microfinance Digital Innovation Service	Microfinance Digital Innovation Service	1. I use the microfinance digital innovation service regularly. 2. The microfinance digital innovation service has improved my financial management. 3. The microfinance digital innovation service has made my financial transactions more efficient. 4. The microfinance digital innovation service has saved me time in managing my finances.	Interval

Variables/ Sub Variabless	Concept Variables/ Sub Variabless	Indicators	Measurement	Scale
			5. I find the microfinance digital innovation service easy to use. 6. I feel confident using the microfinance digital innovation service. 7. The microfinance digital innovation service offers features that meet my financial needs. 8. The microfinance digital innovation service has improved my access to financial services. 9. The microfinance digital innovation service is reliable.	
Socioeconomic Factors (Anane, Zhang, & Nie, 2021) (Andersson & Wallgren, 2022; Githaiga, 2021)	Socio-Economic Factors Affecting Microfinance Access	Income, education, collateral, social networks, geographical locations	1. The income level of smallholder farmers significantly affects their access to benefits of microfinance services. 2. The educational background and literacy levels of smallholder farmers play a crucial role in their ability to understand and utilize benefits of microfinance services. 3. The presence or absence of collateral and assets owned by smallholder farmers has a significant impact on their eligibility for microfinance loans. 4. Social networks and support systems, such as community networks and access to influential individuals, can positively or negatively influence smallholder farmers' access to benefits of microfinance services. 5. The geographical location of smallholder farmers can create barriers to accessing benefits of microfinance services, particularly in rural or remote area	Interval

Source: Author's Compilation from Literature (2023)

3.2.3 Data Sources and Types

This study's primary source of data was questionnaires distributed to farm households in the Ejura Sekyedumase, Sekyere East, Sekyere Central, and Amansie Central districts of Ghana's Ashanti Region. These questionnaires proved to be an invaluable means of gathering information essential for gaining insights into various aspects relevant to the study's research objectives. This section of the research emphasises on the collected data categories, with an emphasis on the quantitative data derived from the questionnaire survey. The majority of the information obtained from farming families in the Ashanti Region was quantitative. This indicates that the information collected was predominantly conveyed in numerical values, making it suitable for statistical analysis. Utilising quantitative data provided numerous benefits for this research project, including the ability to quantify and measure a variety of variables, evaluate hypotheses, and identify statistical relationships.

One significant category of quantitative data derived from the Likert scale responses included in the questionnaire. Respondents were asked to indicate their level of agreement or disagreement with statements on a scale that typically ranged from 1 to 7. These Likert scale responses provide quantitative data that can be systematically analysed to determine the level of agreement or disagreement among survey respondents regarding particular issues related to microfinance digital innovation services. In addition, the questionnaire included queries that required numerical responses. These numeric variables included a variety of factors, including income levels, loan quantities, and various financial metrics. This data was meticulously collected and subsequently analysed, yielding valuable insights into the financial dimensions of agricultural households. Demographic characteristics of repondents were collected. These included respondent characteristics such as age, gender, educational background, and household size. Such demographic information is extremely important because it facilitates the construction of participant profiles and allows for a greater comprehension of how socioeconomic factors may influence their responses.

3.2.4 Population, sample and sampling techniques

3.2.4.1Population

The population of the study constitutes the farm households in Ejura Sekyedumase, Sekyere East, Sekyere Central, and Amansie Central districts of the Ashanti Region of Ghana. Stratton (2021) postulates that the study population is a subset of the population that serves as the source for the actual sample that is taken. It goes beyond the parameters of the concept frame sample. Accounting to the Ghana Statistical Service (2021), in the 2021 Population and Housing Census, approximately 65% of the population in the Ashanti Region and the districts are into agriculture and it serves as a source of their livelihood. The number of population is **35807**.

3.2.4.2 Sample

The study adopted a scientific approach to calculating the sample size of the study. The sample size determination formula was employed. The study's sample size was determined using the formula (Fawkes, Moore, Peers, Mcllwraith, & Chorley, 2011). The formula is stated as follows:

$$n = \frac{c^2 Np(1-p)}{(A^2(N-1) + (c^2 p[1-p])}$$

Where **n** is the sample size, **N** is the target population in question, and p denotes the average percentage of rural households that satisfy the inclusion requirements. **(1-p)** represents the average percentage of rural households that are not expected to satisfy the requirements. **A** denotes the allowable margin of error (calculated as a proportion). The confidence intervals selected determine the mathematical constant **C** Therefore, the targeted population (N) = Rural households engaged in agriculture (35,807), expected incidence (p)= 70%, accuracy (A) = 0.05, and confidence interval (c) = 1.96

$$n = \frac{(1.96)^2(35{,}807)(0.7)(1-0.7)}{(0.05)^2(35{,}807) + (1.96)^2(0.70)[1-0.70]} = \mathbf{376}$$

Therefore, the sample size (n) for smallholder farmers engaged in agriculture in the four districts is **376** The study's sample size was sufficient. Norouzian (2020)

opined that a sample size of 30 or more is considered appropriate for research. Further, the sample for each of the four districts is computed proportionally using the formula:

$$n = \frac{No.\,of\ rural\ Households\ enagaged\ in\ Agriculture}{Total\ No.\,of\ Rural\ Households\ engaged\ in\ Agriculture}\ x\ sample\ Size\ Computed$$

Table 3.2 Sample of Smallholder farmers in Four Districts in the Ashanti Region

District	Number of Households	Proportion of Sample	Sample
Ejura Sekyedumase	6574	(6574/35807) x 376 = 69.03	69
Sekyere East	4243	(4243/35807) x 376 =44.55	45
Sekyere Central	8430	(8430/35807) x 376 =88.52	89
Amansie Central	16560	(16560/35807) x 376 =173.89	174
Total	**35807**		**376**

Source: Ghana Statistical Service (2021)

3.2.4.3 Sampling techniques

The study applys the probability sampling technique in examining the objectives with the quest to answer the research questions and test the hypotheses of the study. Probability sampling refers to the choosing of a sample from a population based on the notion of randomization, often known as chance or random selection (Siedlecki, 2020). This sampling method is suitable for the study because probability sampling provides an accurate representation of the population, allowing for the collection of higher-quality findings. When there is typically a large variety of individuals in a population, researchers heavily rely on this method because it allows them to generate samples that accurately represent the population as a whole (Abi, 2019). The study samples the four districts in the Ashanti Region using their dominants in agriculture (GSS, 2021). Further, the smallholder farmers in the four communities form the sample frame of the study and have been stratified based on the 2021 Population and Housing Census data (Ghana Statistical Service, 2021). In the four districts, there are 35,807 smallholder farmers engaged in agriculture activities ranging from crop farming, tree planting, livestock farming, and fish farming. Another criterion

used for selecting these communities is that there are MFIs that provide services for rural households engaged in agriculture, thereby making them more relevant for the study. The study sample sampled 376 smallholder farmers. The detailed sample size per district is presented in Table 3.2.

The smallholder farmers were sampled using simple random sampling techniques. In each of the communities, the households that are engaged in agriculture were identified with the help of the Assemblyman in the area using the MoFA definition of farmers who cultivate a total area of 2 hectares (approximaly 5 acres) or less. The smallholder farmers were selected randomly by giving unique numbers to each household they are located which were written on the entrance to their room. This will be randomly done until the required number of the sample was achieved. The sampling method is suitable as it helps eliminate bias in choosing participants in a study. It gives equal chances to all smallholder farmers to be part of the study.

3.2.4.4 Data collection technique

The study employs a structured questionnaire to gather primary quantitative data from smallholder farmers in the four districts in the Ashanti region of Ghana. The data to be collected was numerical and further classified as discrete and continuous. As shown in Figure 3.1 quantitative data are numerical which can be data with only a particular number or data with any numerical value.

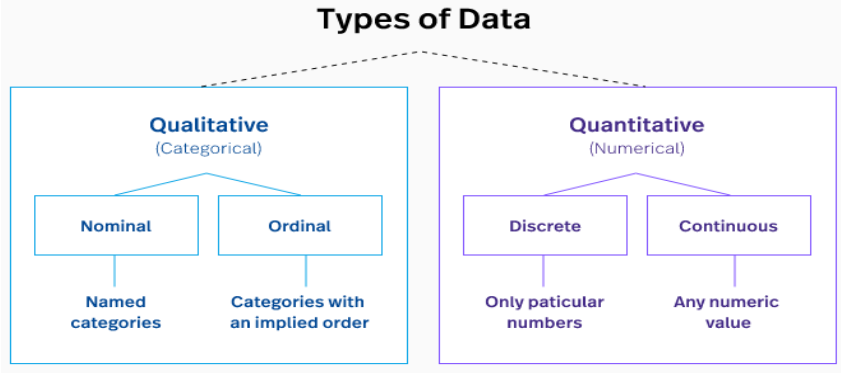

Figure 3.1 Figure Types of Data

The questionnaire is divided into six (6) parts. The questionnaire is rated on a seven-point Likert scale ranging from strongly agree (7) to strongly disagree (1) for part II to part V of the questionnaire. Part I covers the demographic and socioeconomic information of the smallholder farmers and part VI socio-economic factors. Under the demographic and socioeconomic information, there are nine (9) items such as age, gender, farm size, farming experience, level of education, the average income from the farm, off-farm income, household size, attitude towards risk and farm size. Part II of the questionnaire encompasses questions measuring benefits of microfinance services. There are three (3) sub-divisions such as microcredit, micro savings benefits , and micro-insurance. In all, there are fourteen (14) sub-constructs measuring benefits of microfinance services to rural farmers. Examples of constructs measuring benefits of microfinance services are "the loan interest is reasonable", "the savings interest is reasonable", and insurance benefits are effectively adapted from Robert et al. (2021), Benami and Carter (2021).

The Part III of the instrument dwells on the financial need of household farmer of a farmer. In this part, eight (8) sub-constructs are used to measure the financial need of household farmer in the study areas. The study follows the works of (Benami & Carter, 2021; Kono & Takahashi, 2010). Example of items used to measure the financial need of household farmer is "the financial need is to purchase farm inputs (improved seed, fertilizer, agrochemicals)", and "my finance needs to finance working capital".

Furthermore, Part IV of the questionnaire measures the intention of using microfinance digital innovation Services. The measurement comprises 8 sub-constructs. The questionnaire was adapted and modified to reflect the focus of the study from Rouibah, Abbas, and Rouibah (2011), Mbawuni and Nimako (2017) and Humaidi and Balakrishnan (2015). Example of the items employed to measure the variables are "I believe using a microfinance digital innovation service will help me manage my finances better".

Part V of the questionnaire encompasses the measurement of the use of microfinance digital innovation services by smallholder farmers in the selected

communities in the Ashanti Region. The measurement encompasses 10 sub-constructs The study adapted and modified the items from Basri (2018), Rahmiati, Susanto, Hasan, and Pujani (2022) and Samartha et al. (2022). Examples of items employed in measuring the variables are “I use the microfinance digital innovation service regularly”, “the microfinance digital innovation service has improved my financial management”.

Finally, part IV of the instrument measursing socio-economic factors smallholder farmers in the four selected communities in the Ashanti Region. Five sub-construct were used to meaure the variable following the work of Presbitero and Rabellotti (2014) and Asante-Addo et al. (2017). Examples of items employed in measuring the variables is “the income level of smallholder farmers significantly affects their access to benefits of microfinance services”.

3.2.4.5 Validity and reliability of test results

3.2.4.5.1Validity of testing results

The validity of a specific instrument is contingent on the reliability of the study instrument. Langbroek and De Beuckelaer (2007) present an example of how to measure reliability by overcoming the study's conveyance twice using the Cronbach Alpha coefficient technique was conducted using the SPSS software. The current study employed Cronbach's alpha to evaluate the reliability of the study constructs.

3.2.4.5.2 Reliability of testing results

The implementation of a pilot test enhanced the reliability of the questionnaire. The pilot study will be carried out in Mampong District and Sekyere West District. To perform the test, 10 farmers each from the two districts were sampled to participate in the study. This enabled the researcher to readjust the questions such that they were easier to comprehend and ensured that the participants' replies covered all areas. Because doing pilot tests with the same sample as the major research would be unfeasible, the respondents selected from different districts in the Ashanti Region. Z. A. Hassan, Schattner, and Mazza (2006) contend that if the same participants are employed in both the pilot and main studies, the results of the latter may be influenced

by the subject's experience from the pilot. A pilot study is undertaken before the complete implementation of the research instruments and methods to identify possible issue areas and inadequacies (Siedlecki, 2020).

3.2.4.6 Data analysis techniques

The primary data collected with the aid of the structured questionnaires was subjected to a quality process to ensure that the responses generated from the respondents are consistent and follow a logical flow. The questionnaires retrieved were edited and coded into Statistical Package for the Social Sciences (SPSS) version 26 and Smart PLS 4 The descriptive statistics of the study variables was then be computed using mean, standard deviation, minimum, and maximum. The demographic information of the respondents will be analyzed using frequencies and percentages. The analysis of five research questions and the hypotheses developed in the study was analyzed using various inferential statistics and developing the study model by employing the technique of multivariate statistical analysis used to investigate structural connections between the study variables. This was done to establish the direct and indirect relationships between the variables and the hypothesis tested. The details of the analysis per each research question are discussed below.

Exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modelling (SEM) are common statistical methods for analyzing data in social sciences (Polito & Liknaitzky, 2022). EFA is used to identify the underlying structure or dimensionality of a set of variables and to explore the relationships among them (Taber, 2018). On the other hand, CFA is a confirmatory technique that tests the hypotheses about the factor structure that was identified in EFA (Pandey & Bhartiy, 2019). SEM combines both EFA and CFA techniques and allows for the testing of complex models that specify the relationships between variables and latent factors (Kline, 2015). EFA was used as a data-driven method to identify relationships between variables being studied. This technique is especially useful when little is known about the structure of the variables or when researchers need to generate new hypotheses (Taber, 2018). It is important to note that the application of these

techniques requires a good understanding of the underlying assumptions, model selection criteria, and appropriate software tools (Hair, Risher, Sarstedt, & Ringle, 2019).

When executing an EFA, many processes must be completed. These stages include data screening and processing, eigenvalue extraction, solution factor count, solution factor rotation, and solution interpretation. Previous research neglected this problem, which led to validity concerns when attempting to create correlations between their study variables (Vidyakala, 2020). As a consequence, the EFA technique was used to filter and process the data in this study in preparation for future analysis. Reviewing the standardised coefficients, critical ratios, and any other model fit indices are done to establish the measurement model that was used for an investigation (Teeroovengadum, Seetanah, Bindah, Pooloo, & Veerasawmy, 2021). SEM inquiry, on the other hand, requires model selection, data collection and screening, parameter estimations, analysis of model fit to data, interpretation of model parameters, and assessment of competing models' plausibility (Ockey, 2013).

To test the proposed research model, this research made use of the recommended two-stage statistical technique that (Hair et al., 2019) presented (Figure 2.8). At first, the CFA evaluation model was broken down and examined. Researchers in the discipline of confirmatory factor analysis want to determine how well responses on a $p \times 1$ vector of observable random variables may be used to assign a value to one or more unknown variables (s) η. Important steps in the investigation include estimating and evaluating the loading of each item used to tap characteristics of the unobserved latent variable. In other words, depending on the ξ observed response, the unobserved latent variable predicts a vector of $y[i]$ values stated as:

$$Y = \Lambda\xi + \text{ò} \quad (1)$$

where Λ is a $p \times k$ matrix k equal to the number of latent variables, and Y is a $p \times 1$ vector of observed random variables (Yang-Wallentin, Jöreskog, & Luo, 2010). Since Y and are imprecise estimates $\text{ò}\,\xi$, the model additionally includes errors, ò. Maximum likelihood (ML) estimates are produced by repeatedly reducing the fit function.

$$F_{ML} = 1n\left|\Lambda\Omega\Lambda^{'} + I - diag(\ \Lambda\Omega\Lambda^{'})\right| + tr(R(\Lambda\Omega\Lambda^{'} + I - diag(\ \Lambda\Omega\Lambda^{'})^{-1} - 1n(R) - p \quad (2)$$

where $\Lambda\Omega\Lambda^{'} + I - diag(\ \Lambda\Omega\Lambda^{'})$ constitute the variance-covariance matrix implied by the projected factor analysis and the R is the observed variance-covariance matrix (Yang-Wallentin et al., 2010). Therefore, the values that are found for the free model parameters are those that minimise the difference between the variance-covariance matrix that is suggested by the model and the variance-covariance matrix that is observed.

In the second part of the study, the SEM technique was used to determine the causal links that existed between the latent variables. Cronbach's alpha (CA) and composite reliability (CR) ratings were used to ascertain whether or not the variables in the research could be relied upon (Nunnally, 1994). To evaluate the convergent validity of the research, the average variance extracted (AVE) as well as the factor loading values with standardisation were computed (J. F. Hair, Anderson, Babin, & Black, 2010). Methods such as Fornell and Larcker (1981) and Heterotrait-Monotrait ratio (HTMT) are used in the research project to calculate the discriminant validity (Henseler, Ringle, & Sarstedt, 2015).

The chi-square test and degrees of freedom (X^2/df), the goodness-of-fit index (GFI), the standard root-mean-square residual (SRMR), the root-mean-square error of approximation (RMSEA), the comparative fit index (CFI), the normed fit index (NFI), the incremental fit index (IFI), and the Tucker-Lewis index (TLI) were used to evaluate the measurement and structural model fit. These methods were recommended by previous research (Browne & Cudeck, 1992). The anticipated conceptual paradigm for this piece of work is shown in Figure 2.8.