CHAPTER III

RESEARCH METHODOLOGY

3.1 Overview of Research Object

3.1.1 International Students

International students are individuals who temporarily leave their home countries to pursue education abroad, typically aiming to earn degrees or participate in exchange programs (Crumley-Effinger, 2022). These students play a crucial role in the internationalization of higher education, fostering cross-cultural exchange and enhancing global competencies among both domestic and international peers (De Wit & Altbach, 2021). Their presence brings academic diversity, enriching the learning environment by introducing new perspectives and promoting international cooperation between institutions (Cao et al., 2018). Furthermore, international students act as cultural ambassadors, building networks that strengthen ties between their home and host countries (Tran & Vu, 2018).

Visa regulations shape the experiences of international students, influencing both their academic journey and post-study opportunities. In the United States, students typically hold F-1 visas for full-time academic programs or J-1 visas for exchange programs (Johnson, 2018). Canada's Study Permit allows students to study and work part-time, while Australia's Subclass 500 Visa enables both study and limited employment opportunities (Adeyanju & Olatunji, 2022). In Europe, students may use Schengen visas for short-term study or national student visas for full-time programs, which often include post-graduation work opportunities (Vosko, 2022). These visa frameworks help regulate international student mobility, enabling students to engage in both academic and professional experiences abroad (Crumley-Effinger, 2022).

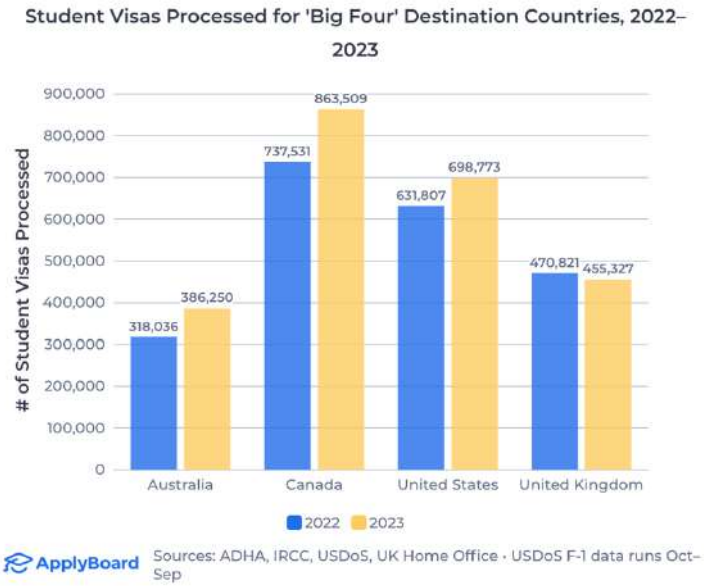

Figure 3. 1 Student Visa Processed for "Big Four" Destination Countries

Source: Basiri, 2024

Figure 3.1 highlights the rise in demand for international education in 2023, particularly in Canada and the United States, both of which saw record-breaking visa applications. In 2023, Canada processed 863,509 visas, while the United States issued 698,773 visas, demonstrating the sustained interest in these destinations. Meanwhile, the United Kingdom experienced a decline in student visa applications, reflecting shifting trends in student mobility (Basiri, 2024). This surge in demand indicates the growing importance of international education as students seek opportunities not only in Anglophone countries but also beyond traditional markets.

International students make valuable contributions to both their host and home countries. In host countries, they drive economic growth by paying tuition and participating in the labor market through part-time employment (Wilczewski et al., 2021). Additionally, they contribute to knowledge exchange programs, helping local institutions internationalize their curricula with diverse perspectives (De Wit & Altbach, 2021). Upon returning home, these students become agents of social and economic transformation, applying global best practices and skills acquired abroad to address local challenges (Nghia, 2019).

Through the networks they build, international students foster long-term cooperation between their home and host nations, enhancing cultural and economic ties (Tran et al., 2020).

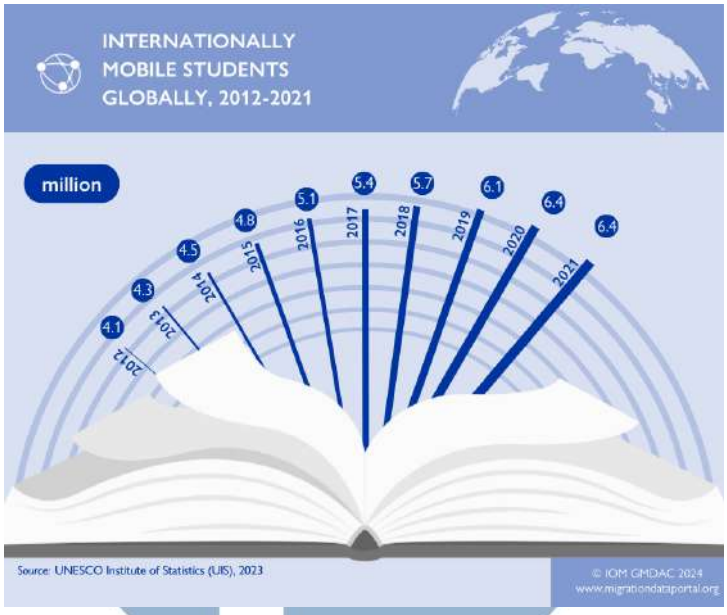

Figure 3. 2 Internationally Mobile Students Globally, 2012-2021

Source: UNESCO Institute of Statistics (UIS), 2023

Figure 3.2 illustrates the rapid growth of global international education, with 6.4 million students enrolled abroad in 2021, up from 2 million in 2000 (UIS, 2023). More than half of these students are concentrated in high-income countries such as the United States, the United Kingdom, Australia, and Germany (Education at a Glance, 2023). Among these, 57% of international students come from Asia, with China and India leading as the primary sending countries (International Migration Outlook, 2023). This trend highlights the importance of international mobility in shaping the global academic landscape and its role in fostering economic growth and cross-cultural exchange.

3.1.2 Indonesian Government Scholarships for Overseas Study

The Indonesian government has made significant investments in scholarships to support students pursuing education abroad, aiming to build a globally competitive workforce. As of 2023, the LPDP (Lembaga Pengelola Dana Pendidikan) fund reached Rp 139 trillion, demonstrating the nation's

commitment to human capital development (Said, 2024). These scholarships are designed to align with national priorities by equipping students with skills essential for industries like digitalization, healthcare, and sustainability (Kemendikbud Ristek, 2024). Although there are several government-funded initiatives, LPDP, IISMA, and BIM serve as the government's flagship programs for international education, offering students critical opportunities for leadership development and global exposure.

Figure 3. 3 Composition of LPDP Scholarship Recipients 2023

Source: DataBoks, 2024

The LPDP program, managed by the Ministry of Finance, provides comprehensive financial support for Master's and Doctoral students pursuing full-time studies abroad. Figure 3.3 shows that as of mid-2023, LPDP supported 7,561 Master's students and 1,139 Doctoral candidates overseas (Santika, 2024). The scholarship covers tuition, living expenses, health insurance, and airfare, enabling students to focus on academic achievement without financial stress. Graduates of the LPDP program are expected to return to Indonesia as leaders in their fields, contributing to national development through research, innovation, and public service (LPDP, 2024).

Another major initiative is the Indonesian International Student Mobility Awards (IISMA), launched by the Ministry of Education, Culture, Research, and Technology (Kemendikbud Ristek). This program facilitates one-semester

exchange opportunities for undergraduate students at top universities worldwide, fostering cross-cultural competence and global collaboration (Kemendikbud Ristek, 2024). IISMA also encourages students to take courses outside their major, broadening their knowledge and adaptability. In 2023, IISMA awarded scholarships to 1,692 students, including 568 vocational students, underscoring the government's commitment to increasing access to international education (Ernis, 2023).

The Beasiswa Indonesia Maju (BIM) scholarship, the newest of the three, focuses on nurturing top talent by supporting both undergraduate and postgraduate studies abroad. BIM targets high-achieving students to help develop Indonesia's global competitiveness in key industries. In 2024, 358 students from the second BIM cohort embarked on their studies abroad, a clear indicator of the program's growing popularity and impact (Bardono, 2023). Like LPDP and IISMA, the BIM scholarship aims to cultivate leadership, foster innovation, and promote global collaboration in line with Indonesia's strategic development goals (Kemendikbud Ristek, 2024).

While LPDP, IISMA, and BIM are the government's flagship programs, these initiatives are complemented by other scholarship schemes that provide additional support for Indonesian students. Smaller or specialized programs, such as joint scholarships with foreign governments and research-focused grants, further expand educational opportunities abroad (Kemendikbud Ristek, 2024). Together, these programs reflect Indonesia's holistic approach to developing a highly skilled workforce that can drive economic growth, innovation, and sustainable development.

Both President Joko Widodo and Minister Nadiem Makarim have emphasized the importance of international education in preparing Indonesia's future workforce. Jokowi has urged for a fivefold increase in LPDP scholarship recipients, reinforcing the need to develop the human capital necessary to compete in the global economy (Said, 2024). Nadiem, in turn, has emphasized the value of international education and cross-cultural experiences, encouraging

students to return with new ideas and best practices from abroad (Kemendikbud Ristek, 2024). These programs are part of a broader strategy to empower Indonesian students to become global leaders, ensuring that the nation remains competitive in an increasingly interconnected world.

3.2 Research Design

3.2.1 Type of Research

Research is essential in understanding and analyzing various phenomena. According to Sekaran & Bougie (2020) there are three main types of research which are exploratory research, descriptive research, and causal research. Each type serves a distinct purpose and utilizes different methodologies.

1. **Exploratory Research**

Exploratory research is defined as a type of research aimed at understanding and providing information about a situation or problem that the researcher is experiencing. It is particularly useful when the researcher has limited knowledge about the topic at hand or when existing research is inadequate. As Creswell & Creswell (2018)notes, exploratory research often employs qualitative methods to gain insights and understanding rather than testing hypotheses. This type of research seeks to explore the topic in-depth and generate preliminary information that can inform future studies.

2. **Descriptive Research**

Descriptive research is focused on describing the characteristics of a population or phenomenon. It answers the "what" questions, providing valuable insights into the current state of affairs. According to Saunders et al. (2019), descriptive research can be both quantitative and qualitative. It aims to identify and gather information about specific characteristics related to a problem or issue.

3. **Casual Research**

Causal research, also known as experimental research, is conducted to determine the cause-and-effect relationships between variables. This type of research involves using one or more independent variables to observe their effect on dependent variables. Saunders et al. (2019) highlight that causal research is crucial for testing hypotheses and establishing relationships between variables.

For this research, a causal research design will be employed, as this approach is crucial for investigating the cause-and-effect relationships among the variables involved. Unlike descriptive research, which aims to detail and explain the nature of a phenomenon, causal research seeks to establish and measure the influence of one variable on another (Sekaran & Bougie, 2020). This research design is particularly suited for understanding how financial knowledge, attitudes, culture, and behavior impact financial literacy, specifically among Indonesian government scholarship recipients studying abroad.

Causal research is essential for this study as it will help determine whether financial knowledge, financial attitudes, financial culture, and financial behavior significantly influence financial literacy, and how financial behavior mediates the relationships between these variables. The study will use a survey method to collect data, utilizing structured questionnaires with Likert scale items to measure participants' agreement with various statements. Participants will rate their responses from 1 (strongly disagree) to 7 (strongly agree), allowing the collection of quantifiable data that can be analyzed to identify causal relationships between the variables.

Through this causal approach, the study aims to establish a clear understanding of the underlying factors that affect financial literacy among students. By identifying how and to what extent these variables influence financial behavior and literacy, the research will not only contribute valuable insights into the financial challenges faced by Indonesian students abroad, but also serve as a foundation for future research exploring similar issues in other contexts.

3.2.2 Research Data

According to Sekaran & Bougie (2020), research data is typically divided into two types: primary data and secondary data. Both data types will be utilized in this study to ensure a comprehensive approach to addressing the research objectives.

1. **Primary Data**

   Primary data refers to data that is collected firsthand by a researcher for a specific research project or purpose. It is original information that has not been previously published or analyzed and is gathered directly from the source through methods such as surveys, interviews, observations, and experiments (Creswell & Creswell, 2018). In this study, primary data will be collected through structured questionnaires distributed to Indonesian government scholarship recipients studying abroad. This method enables the researcher to efficiently reach a wide range of international students across various countries, ensuring diverse representation and real-time responses.

2. **Secondary Data**

   Secondary data refers to data that has been collected and published by someone else, rather than by the researcher. It involves using existing data for a new research purpose and can be found in sources such as books, articles, reports, and databases (Creswell & Creswell, 2018). In this study, secondary data will be gathered from academic research articles, journals, and online databases. These sources will provide a foundation for the theoretical framework, literature review, and the development of research hypotheses, supporting the design of the questionnaire by offering insights into previous findings related to financial literacy, behavior, and other examined variables.

This research will utilize both primary and secondary data to comprehensively address the research questions and objectives. The primary data

will be gathered using questionnaires specifically designed to capture the financial knowledge, attitudes, culture, behavior, and literacy of the target population, allowing for a thorough examination of how these factors interact among Indonesian scholarship recipients studying abroad. By employing a questionnaire as the primary tool, the study aims to gather a significant sample size that can yield robust and reliable results. Meanwhile, the secondary data will be instrumental in contextualizing the findings within the existing body of literature. This data will not only enhance the research's theoretical grounding but also ensure that the results can be compared with previous studies.

3.3 Population and Sample

3.3.1 Population

In research, the term population refers to the complete set of individuals or elements that contain the information needed by the researcher. To ensure clarity and focus in the study, the population is typically broken down into several key components**:** element**,** sampling unit**,** extent**,** and time (Malhotra, 2019). These components help define the scope and boundaries of the research, ensuring that the data collected is relevant to the study's objectives. The population in this study is defined by the following criteria:

1. Element

Element refers to the individual or object that provides the necessary information for the research. It could represent people, institutions, or any entity that possesses the data required by the researcher (Malhotra, 2019). In this research, the elements are Indonesian students who have received government scholarships to study abroad. These students are the focus because they have firsthand experience managing finances in a foreign educational environment, making them the primary source of information for this study on financial literacy and behavior.

2. Sampling Unit

The sampling unit is the specific subset of the population from which data will be collected. It refers to individuals or entities that meet the defined characteristics and are representative of the population (Sekaran & Bougie, 2020). For this study, the sampling unit includes Indonesian government scholarship recipients who:

- Have completed high school (SMA/SMK).
- Are officially registered as students or exchange visitors in a foreign university.
- Are either currently studying abroad or have recently completed their studies.

3. Extend

In this research, the extent includes Indonesian students from all regions of Indonesia, whether they are from major cities or smaller regions, as long as they have received a government-sponsored scholarship. There is no restriction on which home universities they belong to, as long as they are based in Indonesia. The students can be studying abroad in any country, provided they are recipients of an Indonesian government scholarship. This broad geographic and institutional range ensures the research captures a diverse set of experiences and perspectives related to financial management and literacy during international studies.

4. Time

Time refers to the period during which the data or experiences being studied are relevant. It establishes the timeframe within which the study will focus (Malhotra, 2019). In this research, the time frame is defined as students who have studied abroad within the past five years (2019-2024). This timeframe ensures that the study focuses on recent experiences, providing a current and relevant understanding of financial literacy among Indonesian government scholarship recipients studying abroad.

3.3.2 Sampling Frame

The sampling frame represents the list of individuals from the target population, defined by specific criteria. According to (Malhotra, 2019), the sampling frame is a subset of the population that aligns with the study's objectives and provides the basis for data collection.

For this research, the sampling frame includes Indonesian government scholarship recipients who meet the following criteria:

1. Completed high school (SMA/SMK).
2. Currently studying or have completed their studies abroad within the last five years (2019-2024) in a university.
3. Received funding through Indonesian government scholarships.

This sampling frame ensures the data is collected from individuals with relevant financial management experiences during their international studies.

3.3.3 Sampling Techniques

Sampling refers to the process of selecting a subset of elements from a larger population for the purpose of conducting research. According to Malhotra (2019), sampling is essential because it allows researchers to make inferences about a population without the need to collect data from every individual. Sampling techniques are generally categorized into two major types: probability sampling and non-probability sampling. Each method has its own advantages depending on the research design, time constraints, and accessibility of the population.

1. Probability Sampling

Probability sampling is a technique where each element in the population has an equal and known chance of being selected. This method is used to ensure that the sample is representative of the population, reducing bias and increasing the generalizability of the research findings (Malhotra, 2019). The following are the most common types of probability sampling:

A. Simple Random Sampling

This is the most straightforward form of probability sampling. In simple random sampling, every element of the population has an equal probability of being chosen, and the selection is entirely random. For example, if a population consists of 1,000 people, each individual would have a 1 in 1,000 chance of being selected. This method is particularly effective in ensuring that the sample is free from selection bias (Malhotra, 2019).

B. Systematic Sampling

Systematic sampling involves selecting elements from the population at regular intervals. After the researcher randomly selects a starting point, subsequent elements are chosen at fixed intervals (e.g., every 10th person on a list). Although systematic sampling can be faster and easier than simple random sampling, it assumes that the population list is ordered in a way that does not introduce bias (Malhotra, 2019).

C. Stratified Sampling

In stratified sampling, the population is divided into homogeneous subgroups, known as strata, based on a specific characteristic such as age, gender, or income level. A random sample is then drawn from each stratum, ensuring that all segments of the population are adequately represented in the study. This method is especially useful when the population contains distinct subgroups that need to be proportionally represented in the final sample (Malhotra, 2019).

D. Cluster Sampling

Cluster sampling involves dividing the population into groups or clusters, typically based on geography or some other natural grouping. The researcher randomly selects a number of clusters, and then all elements within the selected clusters are included in the sample. This

method is often used when the population is geographically dispersed, making it impractical to sample individuals from across the entire population. While it can be more cost-effective, cluster sampling may introduce additional sampling error if the clusters are not homogeneous (Malhotra, 2019).

2. Non-Probability Sampling

Non-probability sampling differs from probability sampling in that not all elements of the population have an equal chance of being selected. This method is often used when it is difficult or impossible to obtain a complete list of the population or when the researcher wants to focus on specific subgroups based on particular characteristics (Malhotra, 2019). Non-probability sampling techniques include:

A. Convenience Sampling

Convenience sampling involves collecting data from individuals who are easily accessible to the researcher. This method is fast, inexpensive, and easy to implement, making it ideal when time and resources are limited. However, it is important to note that convenience sampling may not be representative of the entire population, as it typically focuses on respondents who are readily available (Sekaran & Bougie, 2020). For example, a researcher might collect data from students at a university campus simply because they are nearby.

B. Judgmental Sampling

In judgmental sampling, also known as purposive sampling, the researcher selects participants based on their expertise or knowledge about the subject being studied. The researcher exercises their judgment to choose individuals who are most likely to provide relevant and valuable information for the study. This technique is often used in exploratory research where the goal is to gain insights from individuals who are well-informed about the topic (Malhotra, 2019). For instance,

in a study on financial literacy, the researcher may specifically select scholarship recipients who have experience managing finances abroad.

C. Quota Sampling

Quota sampling is a technique where the researcher divides the population into subgroups and ensures that a certain number (quota) of participants from each subgroup are included in the sample. The researcher may use convenience or judgmental sampling to fill these quotas. Quota sampling is useful for ensuring that different segments of the population are represented, but it does not guarantee that the sample is randomly selected or fully representative (Malhotra, 2019). For example, a researcher studying the financial behaviors of students might ensure that the sample includes a specific number of undergraduate and postgraduate students.

D. Snowball Sampling

Snowball sampling is often used when the population is difficult to reach. In this method, initial participants are selected and asked to refer other individuals who meet the study criteria. The process continues until a sufficient number of respondents have been gathered. Snowball sampling is commonly used in studies involving sensitive topics or hidden populations, where it might be difficult to identify potential participants through conventional means (Malhotra, 2019). For example, a study on expatriate scholarship recipients might begin with a few known participants who then refer other recipients within their network.

For this research, non-probability sampling is applied, specifically using the judgmental sampling technique. Since the research focuses on Indonesian government scholarship recipients who have studied abroad, it is essential to select participants who meet specific criteria, such as having completed or currently pursuing studies overseas on a government scholarship. Judgmental

sampling allows the researcher to target individuals who possess relevant experiences in managing finances abroad, ensuring that the data collected is both meaningful and specific to the research objectives. Given the constraints of time and accessibility, this method provides the best approach to obtaining a sample that aligns with the study's focus on financial literacy and behavior.

For this research, non-probability sampling is applied, specifically using the judgmental sampling technique. This method is particularly appropriate because the study focuses on Indonesian government scholarship recipients who have studied abroad, a specific and well-defined subgroup that cannot be accessed through purely random or probabilistic methods. Judgmental sampling enables the researcher to intentionally target individuals who meet the research criteria, which are recipients of government-funded scholarships such as LPDP and IISMA. They possess first-hand experience managing finances abroad. Such experiences are essential to ensure the data collected aligns with the study's focus on financial knowledge, attitude, culture, behavior, and literacy.

This technique is further justified by the practical constraints of time, accessibility, and the uniqueness of the target population. Given that scholarship recipients may be geographically dispersed and challenging to identify through conventional methods, judgmental sampling allows the researcher to efficiently identify individuals who can provide relevant, insightful, and rich data to address the research objectives. By selecting participants with specific and relevant experiences, judgmental sampling ensures the study produces meaningful findings that accurately reflect the financial management behaviors and challenges faced by this unique group.

3.3.4 Sample Size

to Malhotra (2019), the sample size refers to the number of elements or individuals to be included in the research. Determining the appropriate sample size is critical to ensure the results are statistically reliable and representative of the population. To guide this, Hair et al. (2019) propose a widely accepted rule of thumb for determining sample size in Partial Least Squares Structural

Equation Modeling (PLS-SEM) and other multivariate analyses. Hair et al. recommend that the minimum sample size should be at least five times the number of indicators for all constructs in the research model. This approach ensures that the data collected provides sufficient statistical power for testing relationships among variables while accounting for potential errors in measurement.

The basis for using a 5:1 ratio (minimum) stems from empirical research demonstrating that smaller sample sizes may compromise the reliability and validity of the measurement model, particularly in SEM-based analyses. A ratio of 5 respondents per indicator strikes a balance between practical feasibility (e.g., data collection limitations) and the need for robust parameter estimation. Moreover, Hair et al. (2019) note that for more complex models with greater paths and constructs, the ideal ratio increases to 10:1, further supporting the reliability of the results.

In this study, the research model consists of a total of 22 indicators, distributed across the constructs as follows: 4 indicators for Financial Knowledge, 4 indicators for Financial Attitude, and 4 indicators for Financial Culture (independent variables). Additionally, 5 indicators represent Financial Behavior (the mediating variable), and 5 indicators measure Financial Literacy (the dependent variable). These indicators were carefully adapted from previous validated studies to ensure they comprehensively capture each construct's dimensions.

Because this research is a simple model consisting of 1 mediating variable, we can use Hair et al.'s guideline (2019), the minimum sample size is calculated as follows:

$$Sample\ Size = Number\ of\ Indicators\ x\ 5$$

Therefore, with 22 indicators, the minimum sample size is calculated as:

$$Sample\ Size = 22 \times 5 = 110$$

The calculation demonstrates that a minimum of 110 respondents is required for this study. This sample size ensures sufficient statistical power for evaluating the structural relationships between the variables and supports the robustness of the findings. By adhering to Hair et al.'s recommendation, the study mitigates the risk of underpowered results, ensuring that the analysis yields meaningful insights while aligning with widely accepted methodological standards for SEM research.

3.3.5 Screening Method

In this study, the screening method was applied to ensure that only eligible participants, specifically Indonesian Government Scholarship Recipients who meet the inclusion criteria, were selected for the research. The questionnaire was distributed using Google Forms, which was shared in relevant groups and chats that include individuals with the characteristics of interest. The target group for this study consisted of Indonesian Government Scholarship Recipients who were either currently studying abroad or had recently completed their studies. Additionally, the questionnaire was also distributed via the author's Instagram account, clearly stating the eligibility criteria for participation.

The eligibility criteria for the participants were as follows:

1. Participants must have completed high school (SMA/SMK).
2. Participants must be officially registered as students or exchange visitors at a foreign university.
3. Participants must either be currently studying abroad or have recently completed their studies abroad.

The screening process was crucial in ensuring that only participants who met these criteria were included in the study. After the Google Form was distributed, participants were asked to answer screening questions that helped determine their eligibility. One of the key screening questions required participants to list the university they are currently attending or have attended

abroad. This allowed the researcher to verify if the respondents fit the inclusion criteria for Indonesian Government Scholarship Recipients.

In cases where respondents did not provide a valid university name or failed to meet any of the other eligibility criteria, their responses were excluded from the final data set. This ensured that the data collected was relevant and representative of the target group, enhancing the accuracy and relevance of the findings. The researcher, therefore, performed manual screening to verify the data before finalizing the sample for analysis.

3.4 Identification of Research Variables

3.4.1 Dependent Variable

The dependent variable is the main variable that researchers aim to explain or predict in a study. It is influenced by other variables and reflects the outcomes of interest. Understanding the dependent variable is essential as it helps researchers ascertain the effects of independent variables on it. In general, the dependent variable is the effect or outcome that is measured in response to changes in the independent variables (Hair et al., 2019).

3.4.2 Mediating Variable

A mediating variable serves as a bridge between the independent and dependent variables, explaining the mechanism through which the independent variable influences the dependent variable. This variable provides insights into how or why such effects occur, allowing for a deeper understanding of the relationships between variables. Mediating variables are crucial for developing a comprehensive model that illustrates the underlying processes in a research study (Sekaran & Bougie, 2020).

3.4.3 Independent Variable

Independent variables are those that are manipulated or categorized to observe their effect on the dependent variable. They represent the predictors or influences that can potentially cause changes in the dependent variable. Independent variables can have either a positive or negative impact on the

outcomes being studied, and their identification is vital for establishing cause-and-effect relationships in research (Sekaran & Bougie, 2020).

3.4.4 Control Variable

Control variables are factors that are held constant or accounted for in a study to eliminate their potential influence on the dependent variable. These variables do not form the primary focus of the research but are important for ensuring that the results accurately reflect the relationship between the independent and dependent variables. By controlling for these variables, researchers can isolate the effects of the independent variables more effectively (Hair et al., 2019).

This research uses independent variables, a dependent variable and also a mediating variable. Three independent variables are utilized, which are financial knowledge, financial attitudes, and financial culture. These variables are examined for their significant impact on the dependent variable, financial literacy, which represents the level of understanding and capability individuals possess in managing their financial resources effectively. Furthermore, the study incorporates financial behavior as a mediating variable, which plays a crucial role in clarifying how the independent variables influence financial literacy. By investigating these relationships, the research aims to provide a comprehensive understanding of the factors that contribute to financial literacy.

3.5 Operationalization of Variable

No.	Variable	Operational Definition	Code	Indicator	Research Questions	Journal Reference
1.	Financial Knowledge	Financial knowledge refers to understanding essential financial concepts such as budgeting, interest rates, and inflation, which enable individuals to make informed financial decisions (Bajaj & Kaur, 2021).	FK1	Inflation	I know that the value of money changes with time	Banthia & Dey (2022)
			FK2	Tax Rates	I am quite sure about the calculation of simple interest	
			FK3	Risk Diversification	I have the knowledge about the high level of risk with high return.	
			FK4	Financial Instruments	I am quite confident of using various electronic transactions	
2.	Financial Attitude	Financial attitude reflects an individual's mindset and beliefs about money management, shaping their approach toward financial planning, saving, and spending (Chaulagain, 2021).	FA1	Financial Management	I believe the way that I manage my money will affect my future.	Vieira et al. (2020)
			FA2	Budgeting	It is important to set financial goals for the future.	
			FA3	Saving	I think it is more satisfying to spend money than save it for the future.	
			FA4	Daily Expense	I am willing to spend money on things that are important to me.	
3.	Financial Culture	Financial culture consists of shared values, norms, and	FC1	Financial discussion with peers	I enjoy talking to my peers about money management issues (i.e. taxes, investing, credit cards)	LeBaron-Black et al. (2022)

		traditions within a society, influencing individuals' financial behaviors, including saving and investing habits (Csorba, 2020).	FC2	Financial education from parents	My parents explicitly taught me about finances (e.g., credit cards, debt, budgeting, savings)	
			FC3	Financial socialization from parents	Within the family, we openly discussed our finances	
			FC4	Self-financial observation	I learned how to manage money by observing how my parents managed money	
4.	Financial Behavior	Financial behavior refers to the practices individuals adopt in managing financial resources, such as budgeting, saving, and borrowing, to achieve financial stability (Zulaihati & Widyastuti, 2020).	FB1	On-time payment	I pay my bills without delay.	Vieira et al. (2020)
			FB2	Bill management	I take notes and control my personal expenses (e.g., expense and revenue spreadsheet).	
			FB3	Credit card usage	I am able to identify the costs I pay to buy a product on credit.	
			FB4	Monthly saving and expenses	I save some of the money I get each month for a future need.	
			FB5	Debt management	I always pay my credit cards on time to avoid extra charges.	
5.	Financial Literacy	Financial literacy is the ability to apply financial knowledge and skills effectively in managing personal finances, including budgeting, borrowing, and investing (Koçoğlu, 2021).	FL1	Budgetary control	I have a budgetary plan	Alarcon et al. (2024)
			FL2	Financial planning	I set aside money for future needs.	
			FL3	Financial saving	I save a part of my income regularly.	
			FL4	Financial security	My investments are diversified to balance the risk	
			FL5	Financial tools and method comprehensiveness	I save money via savings account, property, or in collective investment scheme.	

3.6 Data Analysis Techniques

3.6.1 Validity Test

Malhotra (2019) explains that the purpose of conducting a validity test is to assess the accuracy and consistency of measurement results for specific characteristics. A higher measurement result indicates stronger consistency, which ultimately enhances the quality and robustness of a research study. Validity testing ensures that the measurement instrument captures the intended constructs accurately, reflecting a reliable alignment between the test and the actual attribute being measured. As a result, higher validity enhances the credibility of the findings, making the research more dependable.

According to Hair et al. (2019), validity testing consists of two main components: convergent validity and discriminant validity. Convergent validity evaluates whether the indicators are positively correlated with the construct they are designed to measure, ensuring that they capture the same underlying attribute. To assess convergent validity, researchers often rely on metrics such as outer loading and Average Variance Extracted (AVE). A high AVE value indicates that the indicators explain a significant portion of the variance for their respective constructs, demonstrating strong internal consistency and alignment.

Discriminant validity, on the other hand, ensures that a construct is empirically distinct from other constructs by assessing the extent to which its indicators differ from those of other constructs. Two commonly used techniques to assess discriminant validity are the Fornell-Larcker Criterion and cross-loading analysis. The Fornell-Larcker Criterion compares the square root of a construct's AVE with its correlations with other constructs, verifying that the construct shares more variance with its own indicators than with external ones. Cross-loading analysis examines whether each indicator loads higher on its designated construct compared to other constructs, supporting the distinctiveness of the measured constructs.

Before conducting the main validity test, researchers commonly perform a pre-test validity test to ensure that the dataset is suitable for factor analysis. In this context, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is used as a diagnostic tool to assess the suitability of the data for factor analysis (Hair et al., 2019). The KMO value ranges between 0 and 1, where a value greater than 0.5 indicates that the sampling is adequate for factor analysis. Additionally, the significance level of the Bartlett's Test of Sphericity is examined to confirm whether the correlations among variables are significant ($p < 0.05$). A significant Bartlett's test further supports the appropriateness of factor analysis. In the pre-test validity assessment, researchers also evaluate the Measures of Sampling Adequacy (MSA) for individual variables, ensuring that each value is ≥ 0.5. Finally, factor loadings are inspected to confirm that each indicator has a value of ≥ 0.5, validating its contribution to the construct.

3.6.2 Reliability Test

Malhotra (2019) describe reliability testing as a method to evaluate the consistency of an indicator's measurement over time. For an indicator to be considered reliable, it must produce stable and consistent results under the same conditions. Reliability assessment often employs a measure known as internal consistency reliability, which gauges how well the items within a construct correlate with one another, reflecting a unified measurement of the intended construct.

This assessment typically involves calculating Cronbach's alpha and composite reliability values, both of which are essential in determining the reliability of a measurement. Cronbach's alpha provides an estimate of the internal consistency by analyzing the correlation between items within a construct, while composite reliability offers a more refined measure that accounts for varying loadings across indicators. When these values meet established thresholds, it signifies that the indicators are consistently capturing the intended construct, ensuring that the measurement instrument is robust and dependable.

3.6.3 Data Analysis Methods Using Structural Equation Model

Hair et al. (2019) describes Structural Equation Modeling (SEM) as a comprehensive data analysis method that utilizes statistical techniques to simultaneously evaluate multiple variables. These variables represent different aspects, such as individual characteristics, organizational activities, situational contexts, and more. SEM allows researchers to examine complex relationships within a model by assessing interconnected variables that contribute to an overarching theoretical framework.

In this study, SEM is employed to investigate the relationships between financial knowledge, financial attitude, and financial culture as they influence financial behavior, which, in turn, affects financial literacy. Here, financial behavior plays a critical role as a mediating variable, bridging the effects of knowledge, attitude, and culture on financial literacy outcomes. To conduct the analysis, the researcher utilizes SmartPLS, a software specifically designed to handle SEM, enabling an integrated evaluation of all variables within the model simultaneously. This approach provides a detailed understanding of how these financial factors interact and influence one another, offering insights into the broader context of financial literacy development.

1. **Variables in SEM**

   In Structural Equation Modeling (SEM), according to Hair et al. (2019), there are two main types of variables: latent variables and observed variables, sometimes referred to as measured or manifest variables. Latent variables represent abstract concepts that are central to the research model, which, in the context of SEM, cannot be measured directly and thus require indicators to capture their essence. These latent variables can be further categorized into exogenous and endogenous types. Exogenous variables, often known as independent variables, influence other variables within the model without being influenced themselves. In contrast, endogenous

variables are dependent variables that are impacted by other variables within the research framework.

For this particular study, financial knowledge, financial attitude, and financial culture serve as exogenous variables, which are theorized to have a positive influence on financial behavior. Financial behavior itself acts as an endogenous variable with a dual role: it directly impacts financial literacy and also serves as a mediating variable between financial knowledge, attitude, culture, and financial literacy. Observed variables, or indicators, are used to empirically measure these abstract latent variables, providing a concrete way to quantify constructs that are otherwise intangible.

2. Stages in SEM Analysis

According to Hair et al. (2019), conducting Partial Least Squares Structural Equation Modeling (PLS-SEM) involves a comprehensive eight-stage process. This method, used in this study, allows for the simultaneous analysis of multiple variables and their relationships, enabling a deeper understanding of the complex interplay between Financial Knowledge, Attitude, Culture, Behavior, and Financial Literacy. Each stage serves a distinct purpose, ensuring the model's rigor and accuracy. The first two stages involve defining the structural and measurement models to specify how variables relate theoretically and practically. Data collection and examination occur next, ensuring data quality before PLS path model estimation. Reflective and formative measurement models are then assessed, followed by evaluating the structural model. Advanced analyses may be conducted to explore mediating or moderating effects, and finally, conclusions are drawn based on the interpretation of results. These stages collectively ensure that the PLS-SEM analysis is thorough and supports meaningful, evidence-based insights into the research objectives.

3. Evaluation of the Measurement Model (Outer Model)

According to Hair et al. (2019), evaluating the measurement model in PLS-SEM involves testing both validity and reliability to ensure that indicators accurately represent their corresponding constructs.

Table 3. 1 Validity and Reliability Testing Criteria

Validity and Reliability	Parameter	Rule of Thumb
Convergent Validity	Loading Factor	> 0.70 for Confirmatory Research. > 0.60 for both the Confirmatory Research and Exploratory Research.
	Average Variance Extracted (AVE)	Loading to others should be less than its loading value in the construct.
Discriminant Validity	Cross-Loading	Loading to others should be less than its loading value in the construct.
	Fornell-Larcker Criterion	The square root of the AVE for a construct should be greater than its correlations with other constructs in the model.
	Heterotrait-Monotrait Ratio of Correlations (HTMT)	< 0.90 for conceptually distinct constructs (strict criterion). A more conservative threshold of 0.85 is often used in confirmatory research.
Reliability	Cronbach's Alpha	> 0.70 for the Confirmatory Research. > 0.60 still accepted for the Exploratory Research.
	Composite Reliability	> 0.70 for the Confirmatory Research. > 0.60 still accepted for the Exploratory Research.

Source: Hair et al., 2019

Validity testing assesses whether a latent variable is appropriately represented by its indicators. Table 3.1 illustrates the criteria for validity testing, including outer loading values, which should exceed 0.7, and Average Variance Extracted (AVE) values that must be greater than 0.5. It also highlights the importance of cross-loading, where each indicator should load more strongly on its associated construct than on others, as well as the Fornell-Larcker criterion, which ensures that the constructs exhibit stronger relationships within themselves compared to others.

On the other hand, reliability testing measures the consistency of the indicators, with key metrics such as Cronbach's Alpha and Composite

Reliability (CR) needing to exceed 0.7. Table 3.1 also presents the criteria for reliability testing. Together, these assessments provide a comprehensive evaluation of the measurement model, ensuring that it is both valid and reliable in representing the theoretical constructs underlying the research.

4. Evaluation of the Structural Model (Inner Model)

According to Hair et al. (2019), the structural model serves to represent constructs and elucidate the relationships between them. Once the relationships among the constructs are established as valid and reliable, the next step involves evaluating the structural model. This evaluation requires criteria based on structural values, particularly through the assessment of the R-squared coefficient, which is aligned with established standards.

Table 3. 2 Structural Model Evaluation Criteria

Criteria	Rule of Thumb
R-square	0.75, 0.50, and 0.25 shows strong, moderate and weak mode
Effect Size	0.02, 0.15, and 0.35 (small, moderate and big)
Significance level	5% (0.05)

Source: Hair et al., 2019

The purpose of the R-squared value is to indicate the strength of the predictive model, calculated as the correlation between specific endogenous constructs. This coefficient reflects the combined effects of exogenous latent variables on endogenous latent variables. As illustrated in Table 3.2, an R-squared value of 0.75 indicates a strong predictive power, 0.5 represents moderate predictive power, and 0.25 signifies weak predictive power.

3.6 Hypothesis Testing

According to Hair et al. (2019), a robust model alone is not sufficient to support an established theoretical framework. Researchers need to identify specific parameters that can effectively represent each hypothesis. This enables the theoretical model to be deemed valid if it meets the following criteria:

1. T-statistic

This test assesses the extent to which each independent variable individually impacts the dependent variable. For the t-statistic to indicate a meaningful effect, its value should exceed 1.64 for a single-tailed test and 1.96 for a two-tailed test.

2. P-value

A hypothesis suggesting an effect between variables is considered significant if the p-value is less than 0.05, indicating that the probability of error falls below this threshold, which validates the significance of the relationship.

3.7 Measurement Model

This study employs a measurement model featuring five key constructs, each represented by various indicators that contribute to first-order confirmatory factor analysis. This analytical approach is designed to validate the constructs and establish the relationships between them. Below is a detailed description of each construct in relation to first-order confirmatory factors:

1. **Financial Knowledge**

Financial Knowledge is represented by four indicators, which are Inflation, Tax Rates, Risk Diversification, and Financial Instruments. In the context of first-order confirmatory factor analysis, these indicators are crucial for demonstrating the theoretical constructs related to financial knowledge. By utilizing these indicators, the study aims to affirm that individuals possess the necessary understanding of essential financial concepts, which is foundational for making informed financial decisions.

2. Financial Attitude

This variable encompasses four indicators, which are Financial Management, Budgeting, Saving, and Daily Expense. In first-order confirmatory factor analysis, these indicators collectively signify an individual's readiness and perspective towards managing finances. The analysis seeks to establish that positive financial attitudes are integral to effective financial

management and goal setting, thus highlighting their role in shaping financial behavior.

3. Financial Culture

Financial Culture is illustrated through four indicators, which are Financial Discussion with Peers, Financial Education from Parents, Financial Socialization from Parents, and Self-Financial Observation. Each of these indicators plays a vital role in the first-order confirmatory factor analysis by capturing the cultural influences that shape financial behaviors. This analysis aims to validate the impact of social interactions and familial teachings on an individual's financial consciousness and practices.

4. Financial Behavior

Represented by five indicators, On-Time Payment, Bill Management, Credit Card Usage, Monthly Saving and Expenses, and Debt Management—Financial Behavior acts as a mediating variable in this model. The first-order confirmatory factor analysis evaluates these indicators to establish how they reflect practical financial management behaviors. This construct is essential in examining how financial knowledge, attitude, and culture translate into real-world financial practices.

5. Financial Literacy

Financial Literacy is measured through five indicators. These indicators are Budgetary Control, Financial Planning, Financial Saving, Financial Security, and Financial Tools and Method Comprehensiveness. In the context of first-order confirmatory factor analysis, these indicators demonstrate the ability of individuals to apply their financial knowledge and behaviors effectively. This analysis aims to confirm that enhanced financial literacy is a direct outcome of improved financial behavior, influenced by prior constructs.

Figure 3.12 illustrates the comprehensive measurement model, showcasing the interrelationships among the constructs and emphasizing the mediating role of Financial Behavior in influencing Financial Literacy.

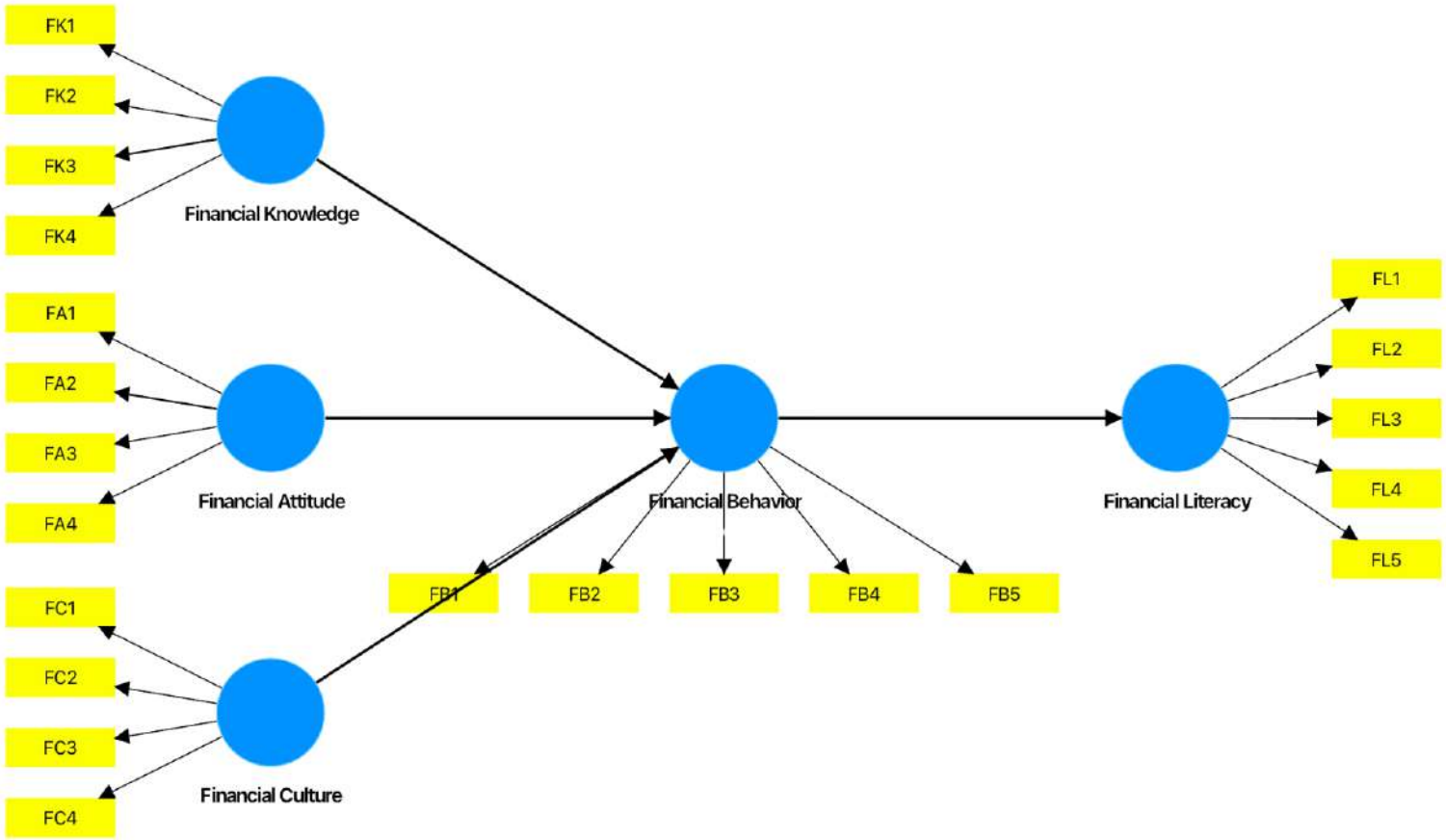

Figure 3. 4 Overall Measurement Model