

An Analysis of the Knowledge Dimension of Financial Literacy among Basic Education Teachers in Southern Antique, Philippines

Kim Rommel E. Panaguiton

Department of Accounting, College of Management, University of the Philippines Visayas, Iloilo City

ABSTRACT

Financial literacy has been considered a life skill necessary for making sound financial decisions. Yet numerous studies around the globe have documented low levels of financial knowledge among different populations and socio-demographic groups. This study presents the results of a financial literacy survey conducted among primary and secondary education teachers in Southern Antique, Philippines. Using the instrument developed by the Organization for Economic Cooperation and Development/International Network on Financial Education (OECD/INFE), the results show that the average financial knowledge score of the respondents is 4 out of 7, and less than half are assessed to have good financial knowledge. Difficulties were noted in interest calculations and understanding the time value of money and diversification. Ordinary least squares (OLS) and stepwise multiple regression analyses further reveals that higher knowledge scores are associated with teachers with high family income, those who have taken graduate studies, those with numerous family dependents, and those teaching at secondary (high school) levels. These findings have implications for policy recommendations on financial literacy interventions.

Keywords: financial literacy, financial knowledge, financial education, OECD, public school teachers

The current global financial environment is more complex and multifaceted than it has ever been in the past. The rapid economic developments and emergence of new financial products in recent years have made it imperative for individuals to be “financially literate” in order to maximize financial opportunities and minimize financial risks. Simply put, one must possess the knowledge and skills for making sound day-to-day financial decisions—from saving and spending to borrowing and investing—to attain a life of financial security and well-being. On the downside, the lack of knowledge of key financial concepts may lead to financial disasters resulting from mistakes in crucial economic decisions. Such financial blunders create negative externalities that may ripple across other economic participants (Huston, 2010). As such, many governments and private institutions around the globe have taken a closer look at the levels of financial literacy among the populace and explored means to improve it.

Over the years, dozens of studies on financial literacy have arrived at a rather alarming consensus—that is, financial literacy is low among different populations and across various socio-demographic groups (see, for example, Morgan & Trinh, 2019; Arceo-Gómez & Villagómez, 2017; Silgoner et al., 2015; Lusardi & Mitchell, 2014; Atkinson & Messy, 2012; Lusardi et al., 2010; Chen & Volpe, 1998). As such, efforts to strengthen financial education and fill the gaps in literacy levels have become a priority in various parts of the world. Likewise, several institutions such as the World Bank Group, Organization for Economic Cooperation and Development (OECD), and Standard and Poor’s (S&P) have also taken steps to continuously measure, monitor, and improve financial literacy levels on a global scale.

In the Philippines, the Bangko Sentral ng Pilipinas (BSP), the country’s central monetary authority and the top financial regulator is at the forefront of local financial literacy studies and financial education

campaigns. Lamentably, the BSP *Financial Inclusion Survey* reported that Filipino adults' average financial knowledge remains alarmingly low (BSP, 2019). Therefore, this calls for a need to strengthen financial literacy programs focusing on the fundamental finance concepts people need in making economic decisions in the country. Moreover, the BSP acknowledged that the problem of low financial literacy could be traced back to poor childhood education and stressed that practical financial education should start at a young age (Lucas, 2018). As such, the Department of Education (DepEd), the agency tasked with managing the country's basic education system, plays a crucial role in promoting financial literacy among the youth. In recent times, the issuance of DepEd Order No. 022, s. 2021, setting forth the agency's policy of intensifying the integration of financial education in the Basic Education Curriculum across various disciplines and grade levels, is a welcome development. In the same light, Republic Act No. 10922 or the "Economic and Financial Literacy Act" mandates schools under the DepEd "to conduct consciousness-raising and knowledge-expanding activities on economic and financial literacy." As the country now has standing policies in place, this will lead to the next question—is the education sector ready to integrate financial literacy education into the basic education curriculum?

Another issue involving finances that hounds the education sector is the reported over-indebtedness of teachers, particularly those employed by public schools. Reysio-Cruz (2019), citing figures from the DepEd, said that as of mid-2019, the total indebtedness of public school teachers from private and public lenders reached an enormous amount of no less than PhP 319 billion (over US\$ 6 billion)¹. Likewise, Fausto (2019) reported that teachers in public schools are 50% more likely to borrow money than other government employees, citing data from the DepEd and the Philippine Institute for Development Studies (PIDS). As we look at teachers as one of the key players in the national government's financial literacy programs, an assessment of financial literacy levels must first be carried out—particularly on the knowledge component. Yet, a comprehensive literature search reveals few published works that were able to study the levels of financial knowledge of teachers in the Philippines.

¹ The BSP (n.d.) reported that the average Philippine Peso per US Dollar exchange rate in 2019 is PhP 51.7958 to US\$ 1.

To contextualize the gaps mentioned, this study aims to determine the level of financial knowledge among primary and secondary education teachers in Southern Antique to provide information that can be used as inputs for financial literacy programs in the province. Financial knowledge is measured using a framework adapted from the Organization for Economic Cooperation and Development/International Network on Financial Education (OECD/INFE)—one that quantifies financial knowledge based on understanding the fundamental concepts of interest, inflation, and risk management (OECD, 2016). As the government looks into the education sector as a vital point in promoting financial literacy among the youth, examining the level of financial knowledge of teachers will help answer the question of preparedness—are the teachers ready to teach financial literacy to elementary and high school students? Understanding the determinants of financial knowledge can guide regulators in designing specific interventions that may improve the level of financial literacy of professionals in the academe. In particular, this study aims to determine the gaps in financial knowledge—and, therefore, must be the priority areas in providing training programs and similar interventions.

Lastly, the analysis will provide the Asian developing country perspective to scholarly discourses on the hindering and facilitating factors affecting the levels of financial knowledge, which is still scarce in the academic literature. The findings may pave the way for further research to identify demographic groups who are most in need of financial literacy programs and provide evidence-based inputs to prospective programs that may counter the looming problem of financial illiteracy.

On the whole, this study addresses the need to assess the level of financial knowledge of basic education teachers and contribute to the literature of financial literacy among professionals in the Philippine public education sector in the context of an internationally-recognized financial literacy framework.

Specifically, the study endeavors to pursue the following lines of inquiry:

1. What is the level of financial knowledge of basic education teachers?
 - a. What is their average score in the OECD-developed financial knowledge assessment tool?

- b. What financial concepts are widely understood by the teachers?
 - c. Are there financial concepts that the teachers find hard to apply?
2. What are the hindering and facilitating socio-demographic factors that affect the level of financial knowledge?
 - a. What socio-demographic factors are predictive of financial knowledge?
 - b. Is the level of financial knowledge higher (or lower) among members of a particular socio-demographic group?
 3. What interventions may be implemented to improve the level of financial knowledge among teachers?
 - a. Are there specific topics/concepts on financial literacy training programs that must be given emphasis?
 - b. What group(s) should be prioritized in the provision of financial literacy enhancement programs?

LITERATURE REVIEW

Defining Financial Literacy

The Oxford English Dictionary (2008) defines literacy as “the ability to read and write; or competence or knowledge in a specified area.” While there is currently no universally accepted meaning of financial literacy, years of research on the subject have conceived several operational and conceptual definitions—from purely knowledge-based to behavioral or attitudinal. For one, Huston (2010), in analyzing previous studies on financial literacy, explained that the latter had been variably defined as a basic knowledge of financial concepts, an ability to understand and apply financial concepts, or a skill to make informed judgments on the use of money, amongst others. Hung et al. (2009) also reported that the definition of financial literacy span from a mere familiarity with the basic economics and finance concepts to the ability to actively integrate financial knowledge in decision-making, including selecting and using financial instruments.

The OECD (2011, p. 47), in response to the diversity in how financial literacy is operationalized

and measured, and with the aim of addressing the lack of internationally comparable data on financial literacy levels, defines financial literacy as “a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being.”

The OECD (2011/2016/2020) framework in defining financial literacy combines three key elements or dimensions, namely: financial knowledge, behavior, and attitudes. The metrics for each of the elements in the framework were drawn from existing studies and cover critical aspects of financial literacy, including money management, financial planning, and the selection of financial products (Atkinson & Messy, 2012). Notably, the OECD/INFE framework is often cited in the literature and has been widely used by independent studies in various countries (see, for example, Salvatore et al., 2017; Arceo-Gómez & Villagómez, 2017; Brejcha et al., 2016; and Agarwalla et al., 2015). Similarly, the working definition of financial literacy under the OECD’s Programme for International Student Assessment (PISA) encompasses the knowledge of financial concepts and the motivation and confidence to apply such knowledge to make informed financial decisions, improve financial well-being, and enable economic participation (PISA, 2012). Lastly, Lusardi and Mitchell (2014) posited that financial literacy refers to the ability to process economic information and make sound decisions in the areas of financial planning, wealth accumulation, post-employment benefits, and debt management.

Defining & Measuring Financial Knowledge

An extensive literature review on financial literacy by Huston (2010) found that over half of the studies done from 1996 to 2008 used the terms financial literacy and financial knowledge interchangeably. For example, the works of Lusardi et al. (2010), Robb & Sharpe (2008), Avard et al. (2005), Bowen (2002), and Hogarth & Hilgert (2002) equated financial literacy with financial knowledge or used the latter as a tool to measure of the former. Meanwhile, other experts and organizations such as the OECD have developed more comprehensive definitions of financial literacy, incorporating the knowledge aspect as an integral element of, but not synonymous with, literacy. As shown in Fig. 1, Huston (2010) suggested that financial literacy has both the (1) understanding or personal finance knowledge dimension and (2) use or personal finance application dimension. In

this context, Atkinson & Messy (2012) proposed that to be considered as financially literate, a person must possess basic knowledge of the key financial concepts and the ability to apply numeracy skills in financial decision-making.

committing mistakes at critical decision points that can be very costly in financial terms (Lusardi et al., 2010; Consumer Financial Protection Bureau [CFPB], 2015; Navickas et al., 2014).

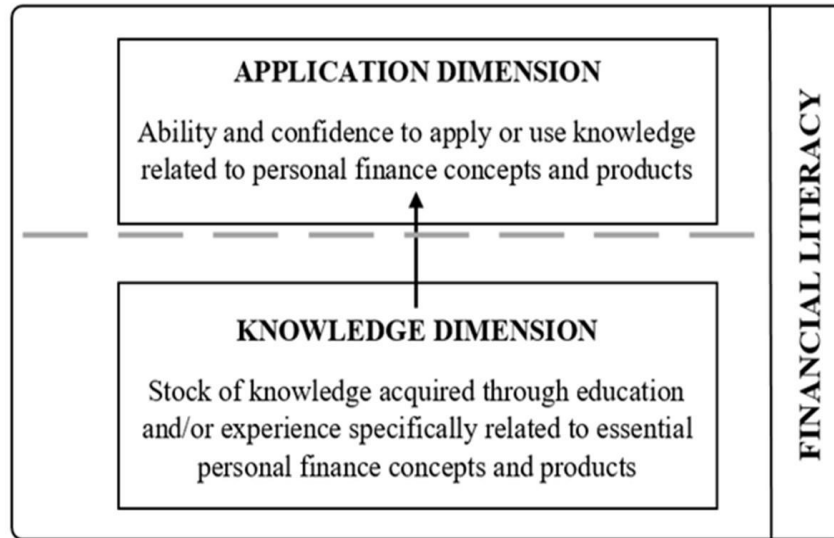


Figure 1. Dimensions of Financial Literacy (Huston, 2010 p. 307)

Financial knowledge, as an integral element of financial literacy, is defined by Huston (2010, p. 307) as a “stock of knowledge acquired through education and/or experience specifically related to essential personal finance concepts and products.” Financial knowledge is therefore associated with the awareness of important financial principles and proficiency in personal financial matters relevant to everyday life. It encompasses the use of one’s understanding of financial concepts and procedures to solve financial problems (Candamio & Díaz, 2020). According to OECD (2016), financial knowledge is a critical component of financial literacy, as the former would be necessary for individuals to compare financial products and make informed financial decisions. Literature suggests that higher levels of financial knowledge are associated with better decision-making and financial outcomes, such as improved financial planning, debt management, and stock market participation (BSP, 2019; OECD, 2016; Hastings et al., 2013). Moreover, Lusardi and Mitchell (2011) proposed that people with higher financial knowledge are more likely to accrue higher wealth and have plans for retirement. On the downside, low levels of financial knowledge may put one in danger of misinformation and increase the probability of

Presently, there are no standardized instruments that would gauge whether a person is financially knowledgeable or not. But while the metrics of the knowledge dimension of financial literacy remain largely a debatable concept, the literature reveals a common set of topics often included in financial knowledge questionnaires. Table 1 shows the list of these topics from published journal articles, working papers, and reports in various parts of the globe.

Most of the instruments used to measure levels of financial knowledge include questions on general numeracy, interest calculations, and understanding of inflation and risk. Notably, the widely-used OECD (2016) toolkit on financial knowledge includes questions on the concept of inflation, the relationship between inflation and the value of money, the calculation of simple and compound interest, financial risk and return, and investment diversification. Similarly, Lusardi and Mitchell (2014) focus their assessment tool on only three questions that cover the understanding of compound interest, inflation, and diversification. In addition to the fundamentals, financial knowledge may involve more advanced business and finance topics such as banking, investments, credit, insurance, and taxes (Hogarth and Hilgert, 2002).

Table 1. Financial Knowledge Test Items

Topic	Authors/Proponents
General numeracy	CFLRI (2013); Almenberg & Dreber (2012); OECD (2011); Boon, Yee & Ting (2011); Ibrahim & Alqaydi (2013); Mandell/JumpStart (2008)
Simple interest	CFLRI (2013); OECD (2011); Shiruporuto (2011)
Compound interest	Thapa & Nepal (2015); Lusardi & Mitchell (2014); Ibrahim & Alqaydi (2013); Brown & Graf (2013); Almenberg & Dreber (2012); CFLRI (2013); OECD (2011); Boon, Yee & Ting (2011); Shiruporuto (2011); Lusardi, Mitchell & Curto (2010)
Concept of inflation	Thapa & Nepal (2015); CFLRI (2013); OECD (2011); Shiruporuto (2011); Mandell/JumpStart (2008)
Inflation and real interest	Thapa & Nepal (2015); Lusardi & Mitchell (2014); CFLRI (2013); Ibrahim & Alqaydi (2013); Brown & Graf (2013); Almenberg & Dreber (2012); Boon, Yee & Ting (2011); Shiruporuto (2011); Lusardi, Mitchell & Curto (2010)
Risk, return and diversification	Lusardi & Mitchell (2014); CFLRI (2013); Ibrahim & Alqaydi (2013); Brown & Graf (2013); Almenberg & Dreber (2012); OECD (2011); Boon, Yee & Ting (2011); Shiruporuto (2011); Lusardi, Mitchell & Curto (2010)
Insurance	Thapa & Nepal (2015)
Investments	Mandell/JumpStart (2008); Ibrahim & Alqaydi (2013)
Taxes	Mandell /JumpStart (2008); Thapa & Nepal (2015)

Source: Compiled by Author

Studies on Financial Knowledge

A vast number of published works on financial literacy have documented low levels of financial knowledge across the globe. For one, the OECD (2020) reported that in an international financial literacy survey carried out in 26 countries across three continents, only 53 percent of the participants achieved the minimum target score of five in a seven-item test. The OECD (2020) proposed that the minimum score for a person to be considered as having good financial knowledge is 70 percent, but the actual average knowledge score of all participants was only 63 percent. Merely less than one-third can calculate both simple and compound interest, and only about 60 percent were able to relate inflation with the value of money and knew the relationship between risk and diversification. A similar study was conducted by the OECD (2016) a few years back and yielded almost identical results. Other studies on financial literacy that used the OECD framework also came up with a similar conclusion—that is, the level of financial knowledge is low across population groups. To highlight some, Morgan and Trinh (2019) reported that the average knowledge score of adults is 3.68 in Laos, 3.52 in Cambodia, and 3.96 in Vietnam;

Ramalho & Forte (2019) found that the average score of Brazilian citizens is 4.38; Arceo-Gómez & Villagómez (2017) claimed that the average score of Mexican high school teenagers is 4.3; Salvatore et al. (2017) reported a 3.5 average score for Italian adults; and a study by Agarwalla et al. (2015) stated an average score of 4.2 for the working young in urban India.

Another popular measure of financial knowledge is the tool developed by Lusardi & Mitchell (2011), which employs the so-called “big three” questions. According to Lusardi & Mitchell (2011), literacy can be measured by a person’s ability to understand three economic concepts that are essential in financial decision-making related to saving and portfolio choices—and these are (1) calculation of compound interest, (2) understanding of inflation, and (3) risk diversification. The Global Financial Literacy Excellence Center [GFLEC] (2015) reported that more than 20 countries had used the “big three” questions to measure financial knowledge, and the results so far have established that financial illiteracy is widespread across the globe, even among well-developed economies. For example, Lusardi & Mitchell (2014) reported that in the United States,

only around 30 percent could correctly answer all three questions and noted similar low figures in other financially well-developed countries like Japan, Australia, and Germany. Also, a study done by Arceo-Gómez & Villagómez (2017) adopting the “big three” approach reported that while 60 percent of the respondents knew the concept of inflation, only 34 percent correctly answered the item on risk and diversification, and 32 percent correctly responded to the question on interest compounding.

Studies on financial knowledge have revealed gaps across various socio-demographic groups. Financial knowledge was documented to be high among men (Janor et al., 2016; Agarwalla et al., 2015; Silgoner et al., 2015; Brown & Graf, 2013; Atkinson & Messy, 2012; Agnew et al., 2012; Lusardi et al., 2010), people with high income levels (Morgan & Trinh, 2019; OECD, 2016; Silgoner et al., 2015; Agarwalla et al., 2015; Brown & Graf, 2013; CFLRI, 2013), belong to older age groups (Arceo-Gómez & Villagómez, 2017; Agnew et al., 2012) or middle-aged groups (Silgoner et al., 2015; Brown & Graf, 2013; CFLRI, 2013; and Atkinson & Messy, 2012), and those who have completed college education (Morgan & Trinh, 2019; Salvatore et al., 2017; Agarwalla et al., 2015; Silgoner et al., 2015; Brown & Graf, 2013).

Studies in the Philippines

Financial institutions such as the Banko Sentral ng Pilipinas (BSP) and World Bank Group are at the forefront of financial literacy assessments in the Philippines, and studies done by these institutions concluded that financial illiteracy is a looming problem in the country. For one, the BSP (2019) *Financial Inclusion Survey* measured Filipino adults' financial literacy level using three questions that cover the concept of inflation and the computation of simple and compounded interest. The results of the BSP (2019) study revealed that only 8 percent got all questions correctly, 41 percent got a score of one in three, and 24 percent obtained a score of zero. Furthermore, while over 50 percent of the respondents understood the effects of inflation, only about one-third were able to correctly answer the questions related to interest calculations. The BSP (2019) reported that the results are problematic, considering that about two-thirds of Filipino adults have a poor understanding of how savings grow, how interest is computed, and what is the consequence of compounding.

A few years back, the World Bank Group (2015) *Financial Capability Survey* utilized a seven-item

test to measure financial knowledge covering basic numeracy, simple and compound interest, inflation, diversification, and insurance—concepts that are deemed critical for informed savings and borrowing decisions, risk mitigation, and taking advantage of financial opportunities. The World Bank Group (2015) had a similar conclusion that the lack of knowledge of basic financial concepts is a serious problem among Filipinos, noting that a mere 2 percent of the surveyed adults got all questions correctly, and only 10 percent got six out of seven. About 20 percent answered no more than one question correctly, and about 10 percent did not appear to understand any of the basic financial concepts. Citing the World Bank Study, a BSP governor once lamented that the financial literacy of Filipinos at 25 percent lags behind other countries in the Southeast Asian Region (Villanueva, 2021).

In terms of socio-demographics, the BSP (2019) reported that higher knowledge scores were noted among participants belonging to the age group 20-40 years old and those with higher educational attainment; while the World Bank Group (2015) revealed that the gaps in the level of financial knowledge are in favor of women, household heads, with high income, have completed tertiary education, and regularly use broadcast, print, and internet media.

There are also several micro studies in the published literature that looked into the financial literacy levels of Filipinos. For one, a study conducted by Ferrer (2018) examining the financial capability of public school teachers revealed that the average financial knowledge score is 1.7 out of five questions covering interest, inflation, risk, bond pricing, and mortgage terms; and that high school teachers scored higher than elementary school teachers. Another study by Fianza (2015) that utilized the OECD framework in measuring the financial literacy of employees in a private university reported that financial knowledge is higher among women, those who belong to the 18-29 age group, and those who have graduate degrees. Other works dealing with financial literacy revealed varying subjects, focuses, and themes (for example, Jabar & Delayco, 2021; Gonzalvo & Avila, 2019; Aldovino et al., 2013; Barte, 2012).

However, it must be emphasized that while there may be numerous studies on financial literacy in the Philippines that can be found in academic journals, studies that focus on teachers are still scarce,

notwithstanding that policymakers often discuss financial literacy and financial education at the national level.

CONCEPTUAL FRAMEWORK

The OECD (2011) developed a financial literacy framework that measures financial literacy as a composite variable composed of three dimensions: namely, financial knowledge, financial behavior, and financial attitudes. This framework is anchored on the OECD's definition of financial literacy as "a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions" and has been widely used to measure, document, and analyze the financial literacy levels across the globe for over a decade to date. With reference to the OECD (2011/2016/2020) framework, the study's dependent variable is financial knowledge, which encompasses a person's understanding of basic finance concepts of inflation, interest, risk, and diversification, as well as basic numeracy skills that may be useful in financial decision-making. The framework used in the study is presented in Fig. 2.

The study's independent variables are the different socio-demographic and employment factors that can be determinants of financial literacy. These include: age, civil status, sex, household income, educational attainment, parental education, number of dependents, number of adults in the household, and year levels taught. The dependent variable, financial knowledge, will be measured using the seven (7) key items under the OECD framework covering the definition of inflation, the impact of inflation on purchasing power, the concept of interest, simple interest calculation, compound interest calculation, risk and return, and diversification. The conceptual and operational definitions of the independent and dependent variables in the framework are presented in Table 2, while the conceptual and operational definitions of the key items of financial knowledge are presented in Table 3. Notably, the operational definitions of the knowledge items are referenced from the OECD (2011/2016/2020) framework.

The use of statistical regression models to link the independent variables (i.e., socio-demographic factors) and the dependent variable (i.e., financial knowledge) will uncover gaps in financial literacy and

Table 2. Definitions of Socio-Demographic Variables that may Predict Financial Knowledge

Variable	Conceptual Definition	Operational Definition
<u>Dependent Variable</u>		
Financial Knowledge	Refers to the awareness and understanding of the basic concepts and terminologies related to personal finance and financial products (Huston, 2010).	The knowledge and understanding of the concepts of inflation, interest, and risk.
<u>Independent Variable</u>		
Sex	The physical characteristics that make males and females different from each other (Merriam-Webster Dictionary, n.d.).	The state of being male or female.
Civil Status	The marital status, or status of an individual in relation to marriage (PSA, n.d.).	The state of being married or not married.
Age	The number of years that a person has lived (Oxford English Dictionary, n.d.).	The generation or age bracket in years in which a person belongs: 21-38 (millennials), 39-53 (gen X), and 54-65 (boomers).
Income	The inflow of wealth or gain usually measured in money that comes in from labor, business, or property (Merriam-Webster, n.d.).	The monthly family income classification of a person based on the income brackets developed by the Philippine Institute for Development Studies (2018).

Table 2 continued

Variable	Conceptual Definition	Operational Definition
Independent Variable		
Educational Attainment	The highest level of education that a person has completed (OECD, 2016).	Education level of a person classified as bachelor's degree holder, bachelor's degree with units in master's degree, or master's degree holder.
Parental Education	The highest level of education that a person's mother or father has completed (adapted from OECD, 2016).	Education level of a person's parent classified as up to secondary or high school undergraduate (uncompleted), college undergraduate (i.e., with college units only), or college graduate.
Number of Dependents	The number of individuals who relies on another for financial support (Kagan, 2023).	The number of one's financial dependents, whether none, one to two, or three to five.
Number of Adults in Household	The number of adults who sleep in the same housing unit and have a common arrangement in the preparation and consumption of food (PSA, 2022).	The number of adults in one's household, whether none, one to two, three to five, or six to nine.
Classes Handled	The education year levels taught by a teacher (DepEd, n.d.).	The year levels handled by a teacher, whether elementary (grades one to six) or secondary (grades seven to twelve).

Table 3. Definitions of Financial Knowledge Items

Variable	Conceptual Definition	Operational Definition	Question Type
Inflation	A general increase in prices and fall in the value of money (Oxford English Dictionary, n.d.).	The understanding that inflation means that the cost of living is increasing rapidly.	Alternate response (true/false)
Inflation and time value	The concept that money is worth more in the present time than the same amount will be at a future time (Fernando, 2022).	The understanding that one can buy more today than in a year from now if inflation stays at a certain level.	Multiple-choice
Interest	A charge imposed for borrowed money (Chen, 2022).	The understanding that in paying more than amount borrowed, the excess amount constitutes interest.	Computation / fill-in the blank with figures
Simple interest	The interest charged on borrowings or earned by savings that is calculated using the principal amount (Hayes, 2023).	The ability to compute interest by multiplying the principal amount by the interest rate.	Computation / fill-in the blank with figures
Compound interest	The interest computed on the sum of the original principal plus the accrued interest (Fernando, 2022).	The ability to determine that compound interest will result to a higher total interest than the simple interest.	Computation / multiple-choice

Table 3 continued

Variable	Conceptual Definition	Operational Definition	Question Type
Risk and return	A finance principle describing the inverse relationship between risk and return (Chen, 2023).	The understanding that an investment with a high return is likely to be high risk.	Alternate response (true/false)
Diversification	The practice of spreading investments among numerous securities or companies (SEC, n.d.)	The understanding that investing in only one company is more risky than investing in many companies.	Multiple-choice

the hindering and facilitating factors affecting the level of financial knowledge. Based on the framework, this study develops the foregoing research hypotheses by underscoring the significant and growing literature on the subject that demonstrates associations between the level of financial knowledge and various socio-demographic factors.

Studies across the globe have claimed that the gender gap in financial literacy favors men (Janor et al., 2016; Agarwalla et al., 2015; Atkinson & Messy, 2012; Lusardi et al., 2010). This is in part anchored on the belief that men generally make household financial decisions, thus gaining greater financial knowledge. On a similar note, as an individual marries, they may have their own families, translating to a more significant number of financial responsibilities and, in the process, increasing their level of awareness regarding financial well-being. The notion that married individuals have higher financial literacy than singles is echoed in the findings of Brown & Graf (2013) and Roy Morgan Research (2003). These studies, therefore, support the following hypotheses on the relationship between financial knowledge and sex and marital status:

H₁: Financial knowledge is higher among male teachers.

H₂: Financial knowledge is higher among married teachers.

In terms of age, Arceo-Gómez & Villagómez (2017) and Agnew et al. (2012) reported that the level of financial knowledge increases as an individual matures in age. This positive relationship may be premised on the fact that higher age may translate into more financial decision-making experiences and product exposures, thereby enhancing financial knowledge. As such, this supports hypothesis H₃ as

follows:

H₃: Financial knowledge is higher among teachers who belong to older age groups.

The positive association between the level of income and financial literacy has been reported in a significant portion of the literature (see, for example, Morgan & Trinh, 2019; OECD, 2016; Agarwalla et al., 2015; and Atkinson & Messy, 2012), with Potrich et al. (2015) suggesting that income is one of the most important socioeconomic variables to explain the variances in the levels of financial literacy. Therefore, it is posited in hypothesis H₄ that financial literacy increases with family income, as stated below:

H₄: Financial knowledge is higher among teachers with higher family income.

It is also theorized that education positively impacts the level of financial knowledge, as reported in the studies by Morgan & Trinh (2019), Salvatore et al. (2017), and Potrich et al. (2015). Hence, hypotheses H₅ and H₆ are formulated as follows:

H₅: Financial knowledge is higher among teachers with higher levels of education.

H₆: Financial knowledge is higher among teachers with educated parents.

Regarding dependents, it is inferred that individuals with more financially dependent family members are more concerned about family well-being and are exposed to more financial decisions, thus having higher financial literacy levels. The same argument might be used to support the theory that financial literacy increases with the number of adults in the household. Therefore, hypotheses H₇ and H₈ are devised as follows:

H₇: Financial knowledge is higher among teachers with more dependents.

H₈: Financial knowledge is higher among teachers who live with more adults in one household.

Lastly, it hypothesized that teachers who handle secondary or high school levels have higher financial knowledge compared to elementary school teachers due to the former’s experience with a more advanced education curriculum and increased exposure to societal financial problems through an increasingly financially-aware student body. Hypothesis H₉ is therefore formulated as follows:

H₉: Financial knowledge is higher among secondary education (high school) teachers.

Specific recommendations are provided regarding the policies and programs to improve financial knowledge among teachers.

RESEARCH METHODOLOGY

Locale & Respondents

The study was conducted in five education districts in the southern part of the Province of Antique, covering the municipalities of Sibalom, San Jose de Buenavista, Hamtic, Tobias Fornier, and Anini-y, as shown in Fig. 3. Antique is one of the six provinces in Region VI - Western Visayas, and one of the four provinces that can be found in the island of Panay in Central Philippines.

Financial literacy is important to local economies and communities. The Province of Antique was chosen as the locale of the study due to its progressive economy, which has recorded promising gains in the business and investment sectors in 2017 and prior years (Petinglay, 2017). Moreover, the Philippines Statistics Authority (PSA), (2022) reported a 10-digit

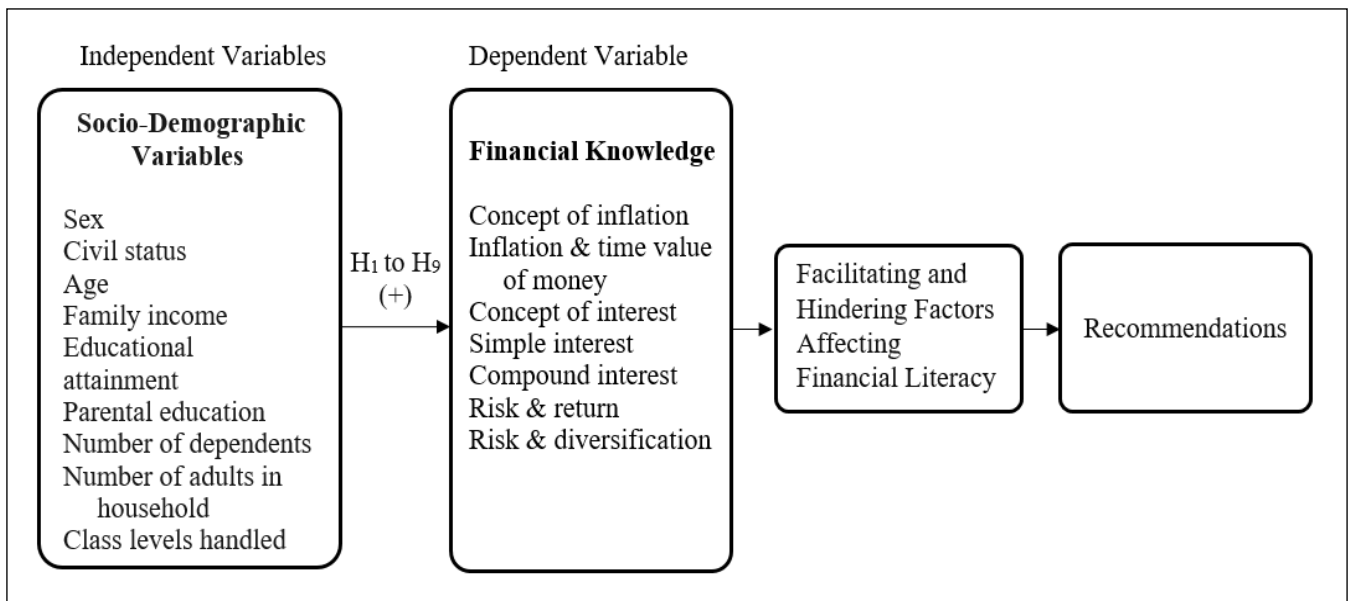


Figure 2. Conceptual Framework (Adapted from OECD-INFE, 2011/2016/2020)

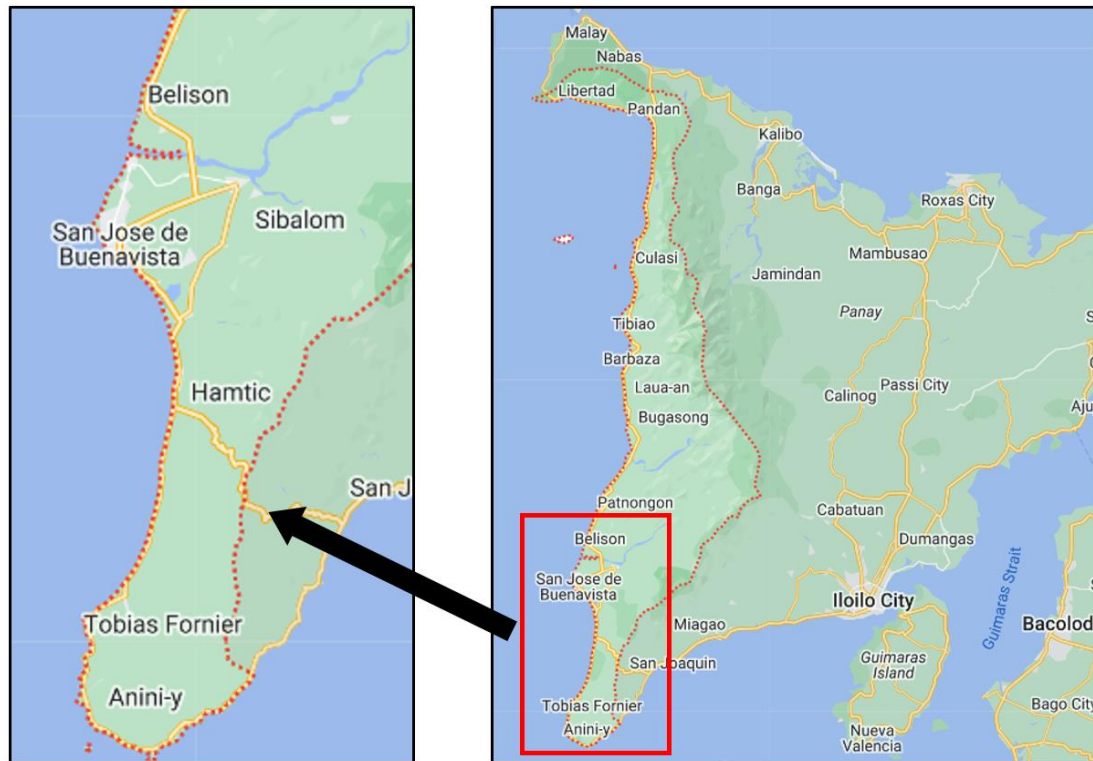


Figure 3. Map of Case Study Municipalities in Antique

(In: <https://antique.gov.ph/home/antique-map/>)

increase in the Gross Domestic Product of the province from 2018 to 2019 (PSA, 2022). The study centered on the Municipality of San Jose de Buenavista and its neighboring towns, as the former is the provincial capital and the center of business and economic activity in the province. Moreover, the municipalities of Sibalom, San Jose de Buenavista, and Hamtic are home to one or more state universities and colleges, making them economically potential towns.

The respondents of the study are full-time public elementary (grades 1 to 6) and public secondary (grades 7 to 12) school teachers in active service for the school year 2018-2019.

Sampling Design

The unit of analysis will be the individual teacher. A list of public elementary and high school teachers was obtained from the Office of the Schools Division Superintendent of the Department of Education Division of Antique to serve as the sampling frame. The total population was 2,170, comprising 1,287 elementary and 883 high school teachers. Slovin's formula was used to determine the appropriate sample size of 338 respondents, given a population size of 2,170 teachers, and to achieve a confidence

level of 95 percent. The total number of elementary school and high school teachers included in the sample size was based on the ratio of the population of the former to the latter (i.e. 59:41).

The study used a two-stage stratified random probability sampling method without replacement to select the respondents. The population of basic education teachers was first divided into two strata—elementary and high school. Then, each stratum was further divided into five sub-strata corresponding to the five municipalities or education districts. The number of respondents per stratum that is included in the sample is based on the ratio of the total number of teachers in the stratum vis-à-vis the population. Furthermore, the number of respondents per sub-stratum was determined based on the ratio of the total number of teachers per district vis-à-vis the stratum population. The individual respondents were selected at random. Table 4 presents the stratified population and final sample size.

A total of 340 teachers responded to the survey, while 15 questionnaires were excluded from data analysis due to high incidence of missing responses in key parts of the instrument. Therefore, the final

Table 4. Stratified Population and Sample Size

District	Elementary		High School	
	No. of Teachers	Sample	No. of Teachers	Sample
Anini-y	117	18	43	7
Hamtic	312	48	213	34
San Jose	347	54	260	41
Sibalom	337	52	247	38
Tobias Fornier	174	27	121	19
Totals	1,287	199	883	139

sample included a total of 325 usable questionnaires, representing 95.6% of the realized sample size.

Research Instrument

The study utilized a financial knowledge questionnaire composed of seven questions adapted from the OECD (2011/2016/2020), slightly modified to fit the local context. The questions covering the concept of inflation, time value of money, concept of interest on a loan, simple interest, compound interest, relationship between risk and return, and diversification are all intended to measure the level of financial knowledge with reference to the OECD framework. The instrument also collected data on the respondent's socio-demographic profile (age, civil status, gender, income, household family size, number of dependents, educational attainment, parental education, and level taught). The OECD (2016) coding procedures and scoring guide were used to determine the financial knowledge score for each respondent.

The instrument was pretested to a group of fifteen (15) respondents who belong to the target population and who were selected using convenience sampling. The pretest resulted in the replacement of obscure or ambiguous words and phrases, improvement of the socio-demographic questions, and enhancement of the overall questionnaire structure.

Scale Reliability Analysis

The Cronbach's alpha (α) is used to gauge the instrument's internal consistency to ensure that the different items measure the same underlying dimension: financial knowledge. The coefficient α value of the seven-item test is determined to be 0.634. Further analysis of the scale reliability test revealed that removing the question on the effect of inflation on purchasing power will increase the coefficient α to 0.651. However, since the increase would only be marginal, the item was retained. Janssens et al. (2008) suggested that an alpha value between 0.60 and 0.80 indicates a good internal consistency. Likewise, according to Ursachi et al. (2015), it is generally recognized that a coefficient α of 0.60 to 0.70 indicates an acceptable level of scale reliability. As such, the full seven-item test was used throughout the study. The item-total statistics of the test items are presented in Table 5. Notably, the OECD (2016) reported that the alpha statistic for the knowledge test in a 2016 international survey is 0.626.

Table 5. Cronbach's Alpha Item-Total Statistics for Scale Reliability Analysis (n=325)

Item	Thematic Areas	
	Corrected Item-Total Correlation	Alpha if Item Deleted
Definition of inflation	.540	.545
Impact of inflation on purchasing power	.187	.651
Concept of interest	.401	.581
Computation of simple interest	.425	.570
Computation of compound interest	.213	.635
Relationship between risk and return	.382	.586
Concept of risk diversification	.324	.605

Empirical Model

The ordinary least squares (OLS) multiple regression was performed to create a model to predict the financial literacy scores using the different socio-demographic characteristics as input variables. Multiple regression analysis is a statistical technique used to determine the magnitude and structure of the relationship between a dependent variable and at least two independent variables, and to forecast a variable based on its relationship with two or more variables (Cote, 2021). The model, therefore, reveals which among the various socio-demographic factors are statistically significant in predicting financial literacy after controlling for other variables. The predictor model is:

where the **FK** variable is the financial knowledge score or the predicted outcome, β_0 is the intercept, β_n are the coefficients of the input variable, X_n are the input variables for socio-demographic characteristics, namely, sex, civil status, age, income, educational attainment, maternal education, paternal education, number of dependents, number of adults in the household, and grade levels taught, and ϵ is the model's error term. The description and coding of the variables used in the regression model are presented in Table 6.

$$FK_i = \beta_0 + \beta_{Sex} X_{i,Sex} + \beta_{Civ. Stat} X_{i,Civ. Stat} + \beta_{Age} X_{i,Age} + \beta_{Inc.} X_{i,Inc.} + \beta_{Educ} X_{i,Educ} + \beta_{M. Educ} X_{i,M. Educ} + \beta_{P. Educ} X_{i,P. Educ} + \beta_{Dep.} X_{i,Dep.} + \beta_{No. Adults} X_{i,No. Adults} + \beta_{Levels Taught} X_{i,Levels Taught} + \epsilon_i$$

Table 6. Description and Coding of Variables in the Regression Model

Symbol	Variable	Coding Procedure
Y	Financial knowledge score	The sum of correct responses in a seven-item financial knowledge test (i.e. 0 to 7)
β_0	Intercept or constant	[Value that would be predicted for the financial knowledge score if all the independent variables are equal to zero]
β_n	Coefficients of input variables	[Values derived by the regression model indicating the relationship between the predictor (input) variable and the financial knowledge score]
X_{Sex}	Input variable for sex	"0" for male and "1" for female
$X_{Civ. Stat}$	Input variable for civil status	"0" for single and "1" for married
X_{Age}	Input variable for age bracket	"1" for ages 21-38 (millennials), "2" for ages 39-53 (generation X), and "3" for ages 54-65 (boomers)
$X_{Inc.}$	Input variable for monthly family income	"1" for Low income, "2" for Lower middle income, "3" for Middle middle income, and "4" for Upper middle income
X_{Educ}	Input variable for educational attainment	"1" for Bachelor's degree holder, "2" for With units in master's degree, and "3" for Master's degree holder
$X_{M. Educ}$	Input variable for maternal education	"1" for Up to secondary undergraduate, "2" for Up to college undergraduate, and "3" for College graduate
$X_{P. Educ}$	Input variable for paternal education	"1" for Up to secondary undergraduate, "2" for Up to college undergraduate, and "3" for College graduate
$X_{Dep.}$	Input variable for number of dependents	"1" for No dependents, "2" for With 1 to 2 dependents, and "3" for With 3 to 5 dependents
$X_{No. Adults}$	Input variable for number of adults in the household	"1" for None to 2 adults, "2" for 3 to 5 adults, and "3" for 6 to 9 adults
$X_{Levels Taught}$	Input variable for year levels taught	"0" for Elementary (grades 1 to 6) and "1" for Secondary (grades 7 to 12)
ϵ	Model's error term	[Variable that captures the effect of the other independent variables that are not incorporated in the model]

For the categorical variables (e.g., civil status and sex), dummies were used to describe the profile of the respondents. For example, a value of "0" is given for males and "1" for females. As for income, age, educational attainment, parental education, number of dependents, and number of adults, the groupings in Table 7 (Profile of Respondents) are used in the coding of responses. For example, a respondent whose monthly family income is within the low-income group has a value of "1," and so forth.

Furthermore, considering that the model has a total of ten predictor variables, the stepwise regression procedure was run to optimize the model and generate one with a higher fit that would only use the predictive variables that are statistically significant from a more extensive set of potential predictors. This process involves adding predictor variables to the OLS model that explains the most variation in the dependent variable and removes the variables which

do not make a significant contribution (Janssens et al., 2008). The use of the stepwise procedure in financial literacy studies that employed the OLS regression model is exhibited in the works of Fang et al. (2022), Kiliyanni & Sivaraman (2018), Agnew & Cameron-Agnew (2015), and Cameron et al. (2014). Fang et al. (2022) suggested that the stepwise process is a method to study the relative importance of the explanatory factors in a multiple regression model.

RESULTS AND DISCUSSION

Profile of Respondents

Table 7 shows the socio-demographic groupings of the sample in terms of gender, civil status, age, income, educational attainment, parental education, number of dependents, number of adults in the household, and class levels handled.

Table 7. Profile of Respondents (n=325)

Characteristics	Frequency ^a	Std. Error
Gender		
Male	58	18.0 %
Female	265	82.0 %
	(2)	
Civil Status		
Single	109	33.7 %
Married	214	66.3 %
	(2)	
Age Bracket		
21-38 (millennials)	115	35.5 %
39-53 (generation X)	148	45.7 %
54-65 (boomers)	61	18.8 %
	(1)	
Income		
Low income	78	24.0 %
Lower middle income	188	57.8 %
Middle middle income	49	15.1 %
Upper middle income	10	3.1 %

Table 7 continued

Characteristics	Frequency ^a	Percentage ^b
Educational Attainment		
Bachelor's degree holder	108	33.4 %
With units in master's degree	194	60.1 %
Master's degree holder	21	6.5 %
	(2)	
Parental Education – Mother		
Up to secondary undergraduate	129	39.8 %
Up to college undergraduate	88	27.2 %
College graduate	107	33.0 %
	(1)	
Parental Education – Father		
Up to secondary undergraduate	128	39.6 %
Up to college undergraduate	115	35.6 %
College graduate	80	24.8 %
	(2)	
Number of dependents		
None	103	32.0 %
1 to 2	165	51.2 %
3 to 5	54	16.8 %
	(3)	
Number of adults in household		
0 to 2	186	57.9 %
3 to 5	116	36.1 %
6 to 9	19	5.9 %
	(4)	
Classes handled		
Elementary (grades 1 to 6)	183	56.5 %
Secondary (grades 7 to 12)	141	43.5 %
	(1)	

^a Missing values (i.e. respondents failed to provide answers) are presented in parentheses.

^b Percentages are based on valid answers.

The teaching profession is dominated by women, comprising over 80 percent of the sample. In terms of marital status, one-third are single, while two-thirds are married. As for age groups, 36 percent are millennials, 46 percent belong to Generation X, and only 19 percent are boomers aged 54 and above.

The groups for income are based on the monthly family income classification of the Philippine Institute for Development Studies [PIDS] (2018). Majority of the respondents belong to the lower middle income group, 25 percent under the low income group, 15 percent under the middle middle income group, and

3 percent under the upper middle income group. As for educational attainment, over 60 percent have taken up courses in graduate school, while only 7 percent have completed a master's degree. In terms of parental education, the majority of the parents did not finish high school, while only around a third were able to finish college. For the household composition, more than half of the respondents have one or two dependents and live in a household with not more than three adults. Lastly, 57 percent of the respondents teach in elementary schools, while 43 percent teach in high schools.

Financial Knowledge Scores

Overall Results

A financially-literate person is expected to have some knowledge of the basic concepts in finance and the ability to apply numeracy skills in financial decision-making (Atkinson & Messy, 2012). The financial knowledge test focuses on responses to seven basic questions designed to check an individual's understanding of various key finance concepts from interest and inflation to risk and diversification. A total score for financial knowledge is computed by assigning one point for every correct

answer. The OECD (2020) proposed that a score of at least 70 percent, or five out of seven items, is the minimum target to be considered as good financial knowledge.

Overall, the study revealed that the average score of basic education teachers on the financial knowledge test is 4.04 (SD = 1.788), or roughly 58 percent of the total items. In terms of the total score distribution, about one-fourth (24.6 percent) of the respondents scored a five, while a meager 4 percent got all correct answers. On the other end, about 5 percent of the respondents failed to answer any test item correctly. The skewness of the test scores was determined to be -0.545, indicating that the distribution was moderately skewed to the left. The kurtosis value was at -0.480, suggesting a platykurtic distribution of scores. Table 8 presents the statistical descriptives for the knowledge scores, while Table 9 presents the frequency distribution of the total correct answers. The average knowledge score of the respondents at 4.04 is slightly lower than the OECD (2020) reported global average score of 4.4, and falls short of the threshold of five out of seven to be considered high knowledge, as suggested by Atkinson & Messy (2012).

Table 8. Descriptive Statistics of Knowledge Scores (n=325)

Statistical Descriptive	Value	Std. Error
Highest possible score	7	-
Mean score	4.04	0.099
Median	4	-
Mode	5	-
Standard deviation	1.788	0.135
Coefficient of variation	0.443	-
Skewness	-0.545	0.135
Kurtosis	-0.480	0.270

Table 9. Frequency Distribution of Scores (n=325)

Score	Frequency	Percent
0	15	4.6 %
1	20	6.2 %
2	33	10.2 %
3	43	13.2 %
4	60	18.5 %
5	80	24.6 %
6	61	18.8 %
7	13	4.0 %
Total	325	100.0 %

Results per Socio-demographic Groups

In addition to the overall financial knowledge results, there are noteworthy relationships between the level of financial knowledge and the socio-demographic characteristics of the respondents. Table 10 presents the mean and median scores per socio demographic group. The groups that scored higher on the average are: men, single, belong to Generation X (ages 39 to 53), belong to the upper middle-income class, have masters' degrees, have highly educated parents, have at least three dependents, live with three to five adults, and teach in high school levels. The study also revealed that correct answers are positively correlated with income levels, educational attainment, number of

dependents, and class levels handled. However, no clear relationships were established for age, parental education, and the number of adults in the household. Notably, the highest average score was documented for teachers belonging to the upper middle-income bracket and above, with a mean of 4.9 and a median of 5. In contrast, the lowest average score was recorded for those ages 54 to 65, having a mean of 3.52 and a median of 4. The statistical significance of the differences in mean scores between or across demographic groupings is explored further in the econometric analysis. With reference to the OECD (2020) ideal score, none of the socio-demographic groups reported a mean score that translates to good financial knowledge.

Table 10. Financial Knowledge Scores per Socio Demographic Group (n=325)

Characteristics	Mean	Median	Std. Dev.
Gender			
Male	4.41	5	1.655
Female	3.97	4	1.810
Civil Status			
Single	4.09	4	1.746
Married	4.01	4	1.818
Age Bracket			
21-38 (millennials)	4.11	4	1.637
39-53 (generation X)	4.20	4	1.733
54-65 (boomers)	3.52	4	2.110

Table 10 continued

Characteristics	Mean	Median	Std. Dev.
Income			
Low income	3.81	4	1.859
Lower middle income	3.94	4	1.811
Middle middle income	4.61	5	1.411
Upper middle income	4.90	5	1.729
Educational Attainment			
Bachelor's degree holder	3.52	4	1.637
With units in master's degree	4.11	4	1.733
Master's degree holder	4.20	4	2.110
Parental Education – Mother			
Up to secondary undergraduate	3.95	4	1.851
Up to college undergraduate	4.09	5	1.855
College graduate	4.09	4	1.668
Parental Education – Father			
Up to secondary undergraduate	4.05	4	1.809
Up to college undergraduate	3.99	4	1.894
College graduate	4.13	4	1.562
Number of dependents			
None	3.73	4	1.843
1 to 2	4.05	4	1.814
3 to 5	4.61	5	1.485
Number of adults in household			
0 to 2	4.02	4	1.775
3 to 5	4.14	5	1.846
6 to 9	3.58	4	1.610
Classes handled			
Elementary (grades 1 to 6)	3.69	4	1.808
Secondary (grades 7 to 12)	4.48	5	1.672

Results per Item

Overall, over 80 percent of the respondents knew that high inflation entailed an increase in the cost of living, though only half of them could apply this definition and tell the relationship between inflation and the time value of money. This means that one in two cannot tell what would happen to the currency's purchasing power if the inflation rate remains constant for one year, and this lack of knowledge may negatively impact one's cash management, particularly on saving and spending decisions. As for interest, while almost three-fourths of the respondents knew the concept of interest charged on loans, difficulties were noted in the computational aspect. Specifically, less than half could correctly compute a simple interest, and only around one in five understood the concept of interest compounding. The lack of competency in this vital area of financial literacy is problematic, considering that knowledge of interest calculations would be essential in decision-making related to long-term savings accumulation and debt management. Regarding financial risk, over seventy percent of the respondents could tell that an investment with a high return is probably high risk, though only about half

demonstrated an understanding of diversification in minimizing risk. A lack of awareness of the fact that investing in only one company is ordinarily riskier than investing in many companies may adversely affect resource allocation decisions. Table 11 presents the total number of correct responses to each of the seven questions on financial knowledge.

The percentage of correct responses per item on the test revealed a strikingly similar trend in comparison to the study conducted by the OECD (2020) in 26 countries. On both datasets, while the majority understood the concepts of interest and inflation, considerably fewer gave correct responses to the application aspects—specifically on understanding the effect of inflation on the value of money over time and in computing simple and compound interest. Also, for the risk-related test items, more correct responses were documented on the risk-return question compared to the one on risk diversification.

Table 11. No. of Correct Responses per Item (n=325)

Question	No. of Correct Reponses	Percentage of Correct Responses	OECD (2020) Percentage
Concept of inflation	265	81.5	80.9
Inflation and purchasing power	175	53.8	65.5
Concept of interest	248	73.6	87.4
Simple interest calculation	148	45.5	57.2
Compounded interest calculation	74	22.8	28.8
Risk and return	228	70.2	79.0
Risk and diversification	175	53.8	63.3

Econometric Analysis

To identify the determinants of financial knowledge and determine whether there are significant differences in the scores across socio-demographic groups, the ordinary least squares (OLS) multiple regression analysis is used. The financial knowledge score is the dependent variable, while the explanatory variables are the socio-demographic characteristics. Furthermore, the stepwise linear regression process is applied to the model to remove the variables that are not statistically important. This process aims to optimize the OLS model by presenting only the socio-demographic variables that are significant in predicting the level of financial knowledge, and to determine the percentage of the variance in the level of financial knowledge that the said significant variables could explain collectively.

Several assumptions tests suggested by Keith (2015) were performed to ensure the data were suitable for multiple regression analysis. These are the test independence of observations, the test for multicollinearity, and the test for normality of residuals or errors. The assessment for independence of observations was carried out using the Durbin-Watson test, which is a check for first-order autocorrelation in the residuals of the regression model (Draper & Smith, 1998). The test yielded a Durbin-Watson statistic value of 1.843, which is within the acceptable range of 1.5 to 2.5, according to Newbold et al. (2013). This value, therefore, indicates that the residuals have relative independence and that serial correlation is absent between them. Moreover, there was no evidence of multicollinearity issues among independent variables as indicated by tolerance values ranging from 0.584 to 0.953, which are all within the acceptable bounds of greater than 0.10 (Marcoulides & Raykov, 2019; Daoud, 2017) or greater than 0.40 (Allison, 1999). Lastly, for the normality test of residuals (errors), a visual inspection of the P-P Plot revealed that the points are approximately aligned along the diagonal line with an angle of 45 degrees. According to Janssens et al. (2008), a close fit between the 45-degree and dotted lines is necessary to assure normality. Hence, the residuals are normally distributed, allowing for the regression model to proceed.

Tests were also performed to check for significant outliers or extreme cases (distance), high leverage points, or highly influential points, which may be problematic data points when performing a multiple regression analysis (Keith, 2015). As for distance,

IBM (2023) suggests that data points with an absolute value greater than 3.0 for the studentized residual are reported as outliers. As for leverage, or unusual patterns on the independent variables, Huber (1981) suggested that the rule of thumb is to treat all leverage values of 0.2 to less than 0.5 as risky and values of 0.5 and greater as dangerous. Lastly, cases that are highly influential on the intercept or the regression line, or those with large Cook's Distance values, are worth investigating (Keith, 2015). Rummerfield & Berman (2017) suggested that a Cook's Distance of greater than 0.5 is considered high, and those greater than 1.0 are extreme. The dataset reported studentized residuals ranging from -2.709 to +1.975, leverage values of 0.006 to 0.080, and Cook's Distance value of 0.023, thereby indicating the absence of potential outliers, high leverage points, and unusual points, respectively.

Determinants of Financial Knowledge

The influence of the explanatory variables on financial knowledge modeled using the OLS and stepwise regression is presented in Table 12. The variables significantly influencing the outcome are family income, educational attainment, number of dependents, and education levels taught. Specifically, all the significant variables have positive regression weights, indicating that higher financial knowledge scores are associated with teachers who have a high income, have taken graduate studies or have master's degrees, have a greater number of dependents, and teach at high school levels. The use of the stepwise regression model resulted in the retention of four out of ten socio-demographic variables that are statistically significant in predicting the financial knowledge score. Notably, the stepwise regression model resulted in a slightly higher corrected goodness-of-fit measure (adjusted R^2 value) when compared with the ordinary least squares regression model. The four significant socio-demographic variables, collectively, could explain about 10 percent of the overall variance in the level of financial knowledge.

Table 12. Regression Analysis of Financial Knowledge (n=325)

	OLS Regression	Stepwise Regression
Sex	- 0.176 [0.268]	-
Civil status	- 0.213 [0.253]	-
Age	-0.043 [0.157]	-
Income	0.326 * [0.141]	0.317 * [0.138]
Educational attainment	0.406 * [0.175]	0.404 * [0.171]
Maternal education	- 0.016 [0.149]	-
Paternal education	- 0.059 [0.158]	-
Number of dependents	0.390 ** [0.149]	0.367 ** [0.141]
Number of adults in household	- 0.110 [0.170]	-
Levels taught	0.792 *** [0.199]	0.830 *** [0.194]
Constant	2.297 [0.694]	1.674 [0.445]
Model sig.	p < 0.001	p < 0.001
R ²	0.120	0.113
Adjusted R ²	0.091	0.102

Standard errors are presented in parentheses.

, **, and * indicate significance at the p<0.05, p<0.01, and p<0.001 respectively.*

The study showed that the average monthly family income is one of the most critical determinants of an individual's level of financial knowledge. As hypothesized (H_4), higher-income respondents were more likely to gain higher knowledge scores than lower-income peers, and the positive relationship between family income and financial knowledge is consistent with a significant portion of the literature on financial literacy (see, for example, Breitbach & Walstad, 2016; Morgan & Trinh, 2019; Agarwalla et al., 2015; Atkinson & Messy, 2012). One possible explanation for this is that people from higher socio-economic classes are more likely to be "financially included" than other groups (BSP, 2019). Financial inclusion, or the state of being financially included, means that people have access to beneficial and inexpensive financial products and services that meet their day-to-day financial needs (World Bank, 2022). On a global scale, Atkinson & Messy (2013) explained that across 16 countries, including the Philippines, the average level of financial literacy was higher amongst those who had made a recent financial product choice than those who hadn't, and that financial literacy levels are likewise higher for individuals who have heard of at least five types of financial products than those who have heard of fewer than five types. In the local setting, a study involving basic education teachers in a province in Central Philippines by Acedillo (2018) reported a positive correlation between monthly household net income and sound financial management practices such as maintaining a savings account, investing in financial instruments, and having an insurance coverage. Hence, higher income levels would provide more windows for using different financial products related to savings, investments, and financial risk protection, as well as more exposure to financial market opportunities, thereby enhancing financial knowledge.

Along the same lines, Agarwalla et al. (2015) suggest that higher income enhances access to materials and sources that improve financial knowledge. According to Fujiki (2020), some of the common sources of financial knowledge include books, brochures, seminars, websites, and financial service representatives, amongst others. Indeed, access to such sources entails additional monetary costs—such as attending a financial literacy seminar, surfing the internet, or buying a book—which may put teachers with low disposable income in a disadvantaged position. Moreover, Sala (2022) explained that new

technologies such as smartphones and digital (mobile) applications have emerged as new tools to stimulate financial literacy. While there may be no comprehensive data on the number of teachers having high-technology tools like smartphones or computers, Alampay (2006) reported that an individual's capacity to own and capability to use information and communications technologies (ICTs) is positively related to household income. Likewise, the BSP (2019) in its Financial Inclusion Survey noted gaps in ownership of smartphone and internet use in favor of higher income groups (i.e., classes ABC). As such, the availability of ICT tools for higher-income groups that have allowed convenient and ready access to different sources of financial information may have helped improve the level of financial knowledge. On the downside, the lack of internet access or the absence of ICT tools as a consequence of low economic resources may have also served as bottlenecks for attaining sound financial knowledge.

Regarding household composition, the teachers in households with more underaged dependents showed an increased financial knowledge score than those with little or no dependents, backing up hypothesis H_7 . This result contradicts the findings of Potrich et al. (2015) and Scheresberg (2013), which reported a negative influence of the number of dependents on financial knowledge. The typical Filipino household composition along with the roles adopted by a financial provider may help explain this. According to Becker (1981), as cited in Kim et al. (2017), households are assumed to operate as a single decision-making unit, and the household head makes the financial decisions on behalf of the other members. The PSA (2017) reported that a rural household in the Philippines has an average of 4.3 members, and about 52% of the household population have ages 24 and below. The age group 22 to 24 may still be counted as financially dependent on the household's income earners as a result of the K to 12 Philippine educational system. In this light, Casingal & Ancho (2022) reported that many Filipino teachers are heads or "breadwinners" of the family where they assume critical financial management roles and responsibilities on matters ranging from the allocation of the household budget for basic life necessities and education, to asset accumulation and setting aside funds for emergency situations. Moreover, families with limited financial resources, though they may often experience high levels of financial stress, still undertake to protect

their children from the consequences of poverty (Kim et al., 2017). This setup, therefore, engenders a sense of responsibility among household heads and financial providers to look after the well-being of the members, which makes it necessary for them to possess financial knowledge. Conversely, the lack of opportunities to gain experience in making financial decisions for a household—which may be the case for teachers with no financial dependents—may lead to low financial literacy.

The study hypothesized (H_5) that financial knowledge and educational attainment have a direct relationship. Indeed, continuing education was found to have a significant favorable influence on the financial knowledge scores of teachers. Specifically, the teachers who have completed a master's degree or taken courses in a graduate program were more likely to score higher than their peers who did not pursue graduate education, and this scenario has overwhelming corroboration in the literature. For one, this confirms the findings of the World Bank (2015) that Filipinos with high educational attainment obtained a significantly higher score on a financial literacy quiz as compared to their counterpart groups with low educational attainment. On a global scale, the OECD study also reported that higher-educated individuals exhibit advanced levels of financial knowledge (Atkinson & Messy, 2012), while Lusardi and Mitchell (2011) found that the prevalence of correct answers to questions regarding interest rates and inflation also rose with education levels. A similar positive relationship between financial knowledge and education levels was also reported by Salvatore et al. (2017), Potrich et al. (2015), and Agarwalla et al. (2015). Potrich et al. (2015), in citing Amadeu (2009), explained that greater exposure on courses in economics, finance, accounting, and administration positively influences one's level of financial knowledge. Indeed, this may be the case in the Philippines, considering that graduate studies curricula in professional education typically include courses in management and administration (see, for example, the University of the Philippines' and De La Salle University's M.A. in Education program of studies). In addition, Chen & Volpe (1998) proposed that by staying in universities longer, individuals will acquire more knowledge on personal finance through exposure to related courses or seminars.

On another note, Guerra-Carrillo et al. (2017) found that higher levels of education have been linked to better cognitive abilities, and that according

to Muñoz-Murillo et al. (2020), individuals with higher cognitive ability generally exhibit higher levels of financial literacy. As such, the completion of graduate studies may have improved the teachers' general mental capabilities, problem-solving skills, and comprehension, allowing them to better understand and analyze complex financial scenarios, thereby obtaining higher financial knowledge scores. It must be noted, however, that the average financial knowledge of 4.62 out of 7 for teachers who have completed graduate studies is still short of the OECD threshold to be considered high knowledge (Atkinson & Messy, 2012). This implies that even for groups with high levels of schooling, more interventions are still needed to improve financial knowledge.

Lastly, the results showed that high school teachers scored higher than elementary school teachers, supporting hypothesis H_9 , and this can be attributed to multiple factors affecting the teaching environment. For one, high school teachers are exposed to a more advanced education curriculum that integrates higher-level financial literacy education. As per government policy, Republic Act No. 10922 urges the DepEd to assess the high school economics curriculum to ensure that financial education becomes integral to the students' formal learning. A review of the DepEd (2016) Curriculum Guide for the K to 12 education programs reveals that the finance-related topics on consumption, savings, and economic policies are integrated into the junior high school *Araling Panlipunan* subject, while accounting and financial planning and calculations of simple and compound interest are covered in senior high school Technology & Livelihood Education (TLE) and Mathematics courses, respectively. Moreover, high schools have also been a frequent target of financial education programs initiated by other government agencies and private institutions. For instance, the Philippine Deposit Insurance Corporation [PDIC] (n.d.), through its Basic Secondary Education Module Development Project, reported that it started distributing teacher's guides on financial literacy to public high schools nationwide as early as 2006. Recently, the DepEd, in partnership with a commercial bank, launched the "*DiskarTech-Aralin sa Madiskarteng Pananalapi*," a financial literacy mobile application targeted at senior high school teachers and learners (DepEd, 2022). These programs illustrate that high schools are indeed prioritized when it comes to financial literacy campaigns, which may have positively impacted the financial knowledge of high school teachers.

On the other end, the study revealed that sex, marital status, age, parental education, and number of adults in the household are not statistically significant predictors of the level of financial knowledge, effectively rejecting research hypotheses H_1 , H_2 , H_3 , H_6 , and H_8 , respectively. For the variation according to sex, male teachers reported a higher average score than female teachers, but the difference is not statistically significant. This opposes the findings of Janor et al. (2016), Atkinson & Messy (2012), and Lusardi et al. (2010). On the other end, this echoes the results of local studies conducted by Fianza (2015) and Aldovino et al. (2013), showing no significant differences in financial literacy when grouped according to sex. This may be attributable to the state of gender equality in the Philippines, a country that performs well in key gender empowerment indicators of different organizations across the globe (Reyes & Yang, 2015). Fianza (2015), citing Fonseca et al. (2012), explained that men and women in a household divide the economic tasks and financial decision-making. Women are usually involved in short-term spending decisions, and men in long-term saving and investing decisions (*ibid.*). This may also explain why there is no significant difference in the financial knowledge scores when the teachers are grouped according to civil or marital status. Since both men and women are already empowered to make financial decisions in their individual capacities, whether they marry or not has a negligible effect on the level of financial knowledge. The lack of association between marital status and financial literacy is also echoed in the findings of Gupta & Hanagandi (2021) and Potrich et al. (2015).

No linear trend on the financial knowledge score can be established when the teachers are grouped according to age brackets. This is consistent with the findings of Aldovino et al. (2013) involving employees of a private Philippine university. Specifically, the highest average score is from the middle age bracket (39-53), while the lowest average is from the old age bracket (54-65). In other words, the level of financial knowledge tends to increase with age as people presumably gain more knowledge and experience but drops among the eldest group of respondents, and this hump-shaped relationship is also evident in the findings of Brown & Graf (2013) and Hogarth & Hilgert (2002). Atkinson & Messy (2012) explained that older people may have experienced a different financial market environment with different technologies, or may have undergone cognitive deterioration that

affected their ability to retain and apply financial knowledge, hence having the lowest score among the various age groups. Indeed, the Philippines experienced drastic economic policy and structural changes in the 80s and 90s (Guinigundo, 2005). These changes made the Philippine financial system more complex, which may have made it a challenge for older aged teachers to keep up.

Lastly, parental education and the number of adults in a household did not show statistically significant regression coefficients in predicting financial knowledge. Specifically, the level of education of the teachers' mothers or fathers did not show any relationship on the former's level of financial knowledge. This is consistent with the findings of Potrich et al. (2015) but differs from the conclusions of Lusardi et al. (2010), where the mother's education was associated with financial literacy, and of Moore (2003), where parental education was found to be statistically significant in predicting financial knowledge between population subgroups. Based on the study's demographic results, about two-thirds of the teachers' mothers and over three-fourths of their fathers have not completed college education. As such, the fact that most teachers' parents have low educational attainment may explain why such is not a significant predictor, considering that the positive association between educational attainment and financial knowledge has overwhelming support in both local and foreign literature. Furthermore, no linear trend was established for the number of adults in the household in terms of predicting financial knowledge, consistent with the findings of Gupta & Hanagandi (2021).

An understanding of the different socio-demographic factors which are not significant predictors of financial knowledge will influence the design and implementation of financial literacy programs and similar interventions aimed at enhancing financial knowledge. That is, such demographic groupings will be least considered in the program prioritization process and selection of target recipients.

CONCLUSION & RECOMMENDATIONS

The advent of the 21st Century brought about considerable advancements in virtually all aspects of the financial system. Today's taxing economic environment made individuals increasingly responsible for their financial security and comfort, as they are faced with a multitude of financial decisions on a day-to-day basis. These choices range from the typical saving, borrowing, and spending choices, to long-term decisions such as selecting a mix of financial products, planning for retirement, and protecting themselves from future financial losses. As such, individuals must be equipped with adequate financial knowledge and skills to maximize market opportunities and participate in financial transactions that enhance their well-being. Unfortunately, literature on the subject has documented massive illiteracy patterns across the globe, particularly among various demographic groups, which may prevent people from making optimal financial decisions.

The study measured the level of financial knowledge of basic education teachers in Southern Antique following the tools and methodology proposed by the OECD. Overall, respondents' average level of financial knowledge at 4.04 in a seven-item quiz (around 58 percent correct responses) falls short of the ideal metric set by the OECD (2020). While most are knowledgeable about basic financial concepts, many cannot demonstrate competence in the application. For instance, while many knew about interest, only a few understood the concept of compounding. Likewise, many could not determine the impact of inflation on purchasing power over time and failed to understand the value of diversification in managing investments. These deficiencies may have serious ramifications on their saving, spending, borrowing, and investing decisions, as well as financial market participation and other economic choices that may enhance one's financial well-being.

The gaps in the levels of financial knowledge across socio-demographic clusters are also broadly similar to those established in the literature. Specifically, the vulnerable groups are the teachers with low family income, without graduate education, a low number of dependents, and who teach at elementary levels. Conversely, the highest average score was recorded among those belonging to families in the upper middle-income class and above, who have completed graduate studies (holders of a master's degree), with three to five financial

dependents, and who teach at high school levels (grades 7 to 12). No significant differences are noted when the teachers are grouped according to sex, marital status, age, parental education, and the number of adults in the household.

Policy Recommendations

The findings of the study provide evidence that the national government, particularly the Department of Education (DepEd), shall continue to prioritize financial literacy interventions for all teachers across various education year levels. Specifically, basic education teachers' below-threshold average financial knowledge levels need to be addressed through exposure to training and education programs designed to enhance literacy, particularly in the knowledge dimension, or the understanding of the basic concepts and terminologies related to personal finance and financial products. The programs must focus on the areas where weaknesses are demonstrated, such as financial numeracy and calculation of simple and compound interest, and on the understanding and application of more complex finance principles, such as the time value of money and investment diversification. These programs may be stand-alone or may be integrated into the regular mandatory In-Service Training (INSET) for teachers.

Taking into account the mandate of Philippine laws on the integration of financial literacy in the basic education curriculum, along with the fact that the DepEd and other government agencies such as the BSP and PDIC already have standing financial literacy initiatives, the DepEd must strengthen the institutionalization of these programs and activities into the education system to ensure sustainability. Additionally, the DepEd may forge partnerships with higher education institutions (HEIs) and business schools that offer courses on financial management and other allied business subjects, such as accounting and economics, to assist in the design of financial literacy programs or the development of training materials or learning modules for teachers. Likewise, the DepEd may tap into public high schools within its jurisdiction that offer the academic track 'Accountancy, Business and Management' (ABM) for senior high school levels to facilitate the conduct of in-house workshops. The ABM track covers courses in business mathematics, accounting, finance, and applied economics, where the different concepts of financial knowledge are integrated. As such, the teachers who handle the courses mentioned above

may form a group of specialists who may take the lead in developing learning materials and conducting financial literacy seminars within their respective schools and other schools within the same district. Lastly, the DepEd may expand its partnerships with private institutions such as commercial banks, insurance companies, and special-interest groups to assist in the development of more inputs, materials, and learning resources on financial literacy. The contents of all materials and resources must be periodically reviewed to ensure their relevance in light of the rapidly changing financial environment.

The results of the study also identified aggregate variances in financial knowledge scores and underscored vulnerabilities within the population. Therefore, in terms of targeting, financial education programs must explicitly focus on demographic groups with low average scores. These are the teachers with low family income, those without graduate education, with few or no dependents, and those teaching at elementary levels. In addition, considering that many teachers failed to perform interest calculations and understand the concept of interest compounding even as they are frequently reported to resort to borrowing to make financial ends meet, financial intervention programs specifically aimed at improving financial numeracy and debt literacy must be provided.

Lastly, financial literacy testing and assessment among teachers must also be institutionalized. While there have been a number of standing financial literacy initiatives in the academe coupled with some financial literacy studies covering Filipino teachers as subjects, the fact remains that there is still a dearth of data on the teachers' level of financial knowledge at the national and regional levels. As such, the DepEd must conduct a comprehensive financial literacy assessment to establish baseline data and integrate periodic testing into the system in succeeding years. This will aid policymakers in assessing the effectiveness of financial literacy interventions by comparing financial literacy levels across different periods, as well as identifying emerging trends in population vulnerabilities. Moreover, periodic financial literacy assessment and monitoring will facilitate the continuous review of the content of financial literacy learning resources and materials and the design of financial capability-building programs. Such periodic assessments will likewise aid in evaluating the efficiency and effectiveness of ongoing financial literacy interventions.

Recommendations for Further Studies

The study offers an initial functional approach to financial literacy assessment in the education sector and provides a foundation for future studies in the field. Taking into account the growing consensus on the need to fill in the gaps in financial literacy and the national government's steps in integrating financial education into the primary education curriculum, future research using the same internationally comparable analytical framework may be done on a larger population or geographical scope to facilitate a more in-depth and evidence-based assessment of the levels of financial knowledge of professionals in the academe, and to allow benchmarking across countries for national strategy formulation. Moreover, the study framework may be expanded to cover the application dimension of financial literacy—that is, the ability and confidence to effectively apply or use knowledge related to personal finance concepts and products to make financial decisions (Huston, 2010). Following the OECD (2020) financial literacy framework, future studies may incorporate assessments on the teachers' financial behaviors or the ways in which they manage their money, select financial products, respond to particular situations involving money, and plan for the future; and financial attitudes, or their way of thinking or feeling towards long-term financial planning.

In addition, future studies may be directed toward exploring and evaluating the degree of the relationships and causalities among the different dimensions of financial literacy, particularly between financial knowledge and financial behaviors. Does having sound financial knowledge lead to better spending, saving, borrowing, and investing decisions? While the positive relationship between financial knowledge and financial behavior may have overwhelming support in the literature (see, for example, Lusardi & Mitchell, 2014; Atkinson & Messy, 2012), additional work has to be done to examine the extent of applicability of this theory in the context of basic education teachers in a developing country. Lastly, taking into account the low level of knowledge in some areas as documented in this study and the idea that many teachers are over-indebted, further studies that focus on debt literacy and financial inclusion may be worth endeavoring to offer additional insights on how to enhance the level of financial literacy and further improve the economic well-being of professionals in the basic education sector.

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Ethical Declaration

All procedures performed were in accordance with ethical standards in research. Informed consent was obtained from all individual participants involved in the study.

Conflicts of Interest

The author declares no conflict of interest.

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Author:

Kim Rommel E. Panaguigon, Department of Accounting, College of Management, University of the Philippines Visayas, Iloilo City; kepanaguigon@up.edu.ph
