Measuring and Characterising the Functional Business Financial Literacy of Entrepreneurs: A Framework and Survey Instrument

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Abstract

The successful establishment and survival of entrepreneurial businesses is critical to economic growth and employment creation. However, entrepreneurs require sufficient levels of business-specific financial competency to operate viable and sustainable businesses. Without the ability to measure functional business financial literacy, it is challenging to provide the necessary training and support to entrepreneurs. Unfortunately, research within financial literacy focuses almost exclusively on the measurement and understanding of personal financial literacy, which centres on individuals' personal financial wellbeing. Personal financial literacy is not equivalent to the financial skills required to ensure business financial wellbeing. This study combines the practical application of business financial concepts with established financial literacy and education theory to better understand and measure entrepreneurs' functional business financial literacy levels.

Specifically, this study comprises three components. The first component proposes a business-specific financial competency framework for entrepreneurs. The objective of the conceptual financial competency framework is to establish what competencies entrepreneurs of different business sizes should achieve. The framework draws structure from the accounting cycle and overlays educational taxonomies to suggest an appropriate level of skills that entrepreneurs in businesses of different sizes require. The conceptual financial competencies framework is grounded in work conducted by the OECD/INFE and adopts the three dimensions of financial literacy formulated by the OECD, namely knowledge, behaviour and attitude.

In the second component of the study, the financial competencies framework is used to develop a survey instrument. This research aims to focus the instrument creation on microbusiness entrepreneurs to address their business financial knowledge and their behaviour and attitudes. Rigour in the formulation of the instrument is ensured through an expert group's input, the undertaking of a pilot survey, and the use and analysis of empirical data from its administration to a convenience sample cohort of 123 South African entrepreneurs, including sole traders, microbusinesses, and small businesses, to quantitatively assess the instruments' reliability and validity.

The third component is an exploratory application of the instrument that uses various demographic information about the respondents and their businesses with the objective of better understanding the factors that affect functional business financial literacy levels. Within the exploratory cohort, higher functional business financial literacy levels are found for entrepreneurs in larger-sized businesses than entrepreneurs in smaller businesses and entrepreneurs with higher education levels than those with less. However, once adjusting for other demographic factors, using a regression model with dummy variables and univariate and

multivariate analysis, no gender difference in financial literacy levels is observable. Also, no correlation is apparent between the respondent's age or racial group, or the businesses age or type and the entrepreneurs' financial literacy levels. Although not based on a representative sample of the South African business environment, these findings provide an initial indication that entrepreneurial support programmes should be tailored based on the educational attainment level of the entrepreneur and dependent on the size of the entrepreneurial business.

The study's main contributions are in conceptualising a framework for assessing the business financial literacy of entrepreneurs, including self-employed individuals, designing a flexible instrument for this purpose, and demonstrating the instrument's application in an initial exploratory assessment. As the application of the instrument, which focuses on the correlation of selected demographic factors with business financial literacy, is based on a convenience sample, the study's contribution is not primarily of an empirical nature. Instead, it provides a foundation for further planned empirical studies and related questions based on larger and more representative samples.

While the instrument itself and the convenience sample were centred around the skills proposed for microbusiness entrepreneurs, the framework and instrument developed in this study are flexible and can be customised to accommodate a range of business and entrepreneur types. Therefore, the instrument is suitable as a starting point for more extensive surveys to inform actions and policies to improve functional business financial literacy, hence ultimately reducing business failure and supporting economic growth and job creation.

Plagiarism Declaration

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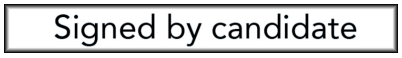

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Acknowledgements

This thesis incorporates several different disciplines and is principally a blend between education and finance. These two "faculties" do not often coexist, and I was delighted to find a supervisor equally interested in the ultimate objective of improving financial education for entrepreneurs to enable them to have the best chance of business success. Francois, thank you for your guidance, enthusiasm and rigour throughout this process.

A thesis is not written in a vacuum, and I was fortunate to have an incredibly supportive family who committed to the doctoral journey along with me. My husband Marco and our children Angelina and Raffa, you make it all worthwhile!

Thanks also to my parents, who have always been in my corner every step of the way.

I also had a group of friends who were permanent cheerleaders through the process, and I so appreciated your "interest" in my word count as I progressed.

Despite a PhD being a long voyage of discovery, I have loved the research process. In the post-dissertation phase, I am excited to start implementing some of the practical findings of how best to support and educate entrepreneurs.

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List of Abbreviations

Abbreviation	Definition
AFS	Annual Financial Statements
ALL	Adult Literacy and Life Skills Survey
ALP	American Life Panel
ANOVA	Analysis of Variance
BP	Budgeting and Planning
CAPI	Computer-Assisted Personal Interviewing
CASI	Computer-Assisted Self-Interviewing
CATI	Computer-Assisted Telephone Interviewing
CPA	Certified Public Accountant
CTT	Classical Test Theory
CVI	content validity index
DEM	Demographic
DFI	Department of Financial Institutions
DLD	Developmental Language Disorder
DNB	De Nederlandsche Bank
DOB	Date of Birth
EBRI	Employee Benefits Research Institute
EDA	Exploratory Data Analysis
EFA	Exploratory Factor Analysis
ELSA	English Longitudinal Study of Ageing
EPS	Encuesta de Protección Social
ERS	Extreme Response Style
FA	Financial Analysis
FILS	Financial Literacy Study
FINRA	Financial Industry Regulatory Authority
FLat World	Financial Literacy Around the World
FP	Financial Data Preparation
FSA	Financial Service Authority
FSP	Financial service provider
FSPS	Financial service providers
FX	Foreign Exchange
GAAP	Generally Accepted Accounting Principles
GDP	Gross Domestic Product
GEM	Global Entrepreneurship Monitor
GenIUSS	Gender Identity in US Surveillance Group
GFLEC	Global Financial Literacy Excellence Centre
HRS	Health and Retirement Study
HSD	Honest Significant Difference
IALS	International Adult Literacy Survey

ICASA	Independent Communications Authority of South Africa
ICO	Initial Coin Offering
ICT	Information and Communication. Technology
IFAC	International Federation of Accountants
IFC	International Finance Corporation
IFRS	International Financial Reporting Standard
INFE	International Network on Financial Education
IRT	Item Response Theory
KMO	Kaiser-Meyer-Olkin
LC	Lifecycle Theory
MANOVA	Multiple Analysis of Variance
MCQ	Multiple-Choice Questions
ML	Maximum Likelihood
MR	Misresponse
MSME	Micro, Small and Medium Enterprises
NARS	Net Acquiescence Response Style
NFCS	National Financial Capability Study
NGO	Non-Government Organisations
NLSY	National Longitudinal Study of Youth
OECD	Organisation for Economic Co-operation and Development
PACFL	President's Advisory Council on Financial Literacy
PAF	Principal Axis Factoring
PCA	Principal Component Analysis
PIAAC	Program for the International Assessment for Adult Competencies
PISA	Programme for International Student Assessment
POS	Point-of-Sale
PRIDIT	Principal Component Analysis of RIDIT Scores
RAA	Raymond Ackerman Academy of Entrepreneurial Development
REG	Engaging with Regulators and Regulations
REV	Reversed Likert Scale
RG	Revenue Generation
RIDIT	Relative to an Identified Distribution
RK	Record Keeping
RTF	Russia Financial Literacy and Education Trust Fund
SEDA	Small Enterprise Development Agency
SEM	Structural Equation Modelling
SME	Small and Medium Enterprise
SMME	Small, Medium and Micro Enterprise
TFL	American Test of Financial Literacy
UCLA	University of California Los Angeles
UCT	University of Cape Town
UK	United Kingdom

UNESCO	United Nations Educational, Scientific and Cultural Organisation
US	United States
VAT	Value Added Tax
VIF	Variance Inflation Factor
YR	Year

Chapter 1 Introduction

1.1 The Importance of Entrepreneurs

Businesses of all sizes drive economic growth. SMEs account for around 70% of global employment, and in the United States, small businesses contribute to more than half of non-farm GDP (Chowdhury, 2011). Therefore, enabling and supporting the formation and growth of small, medium and micro enterprises (SMMEs), inclusive of entrepreneurial start-ups, benefits the local economy and societal wellbeing. As such, globally, governments focus on encouraging and promoting entrepreneurial and new business activity.

Academic research in the entrepreneurial field is prolific. Ferreira, Reis and Miranda (2015) document some of the key research themes that have emerged over the last three decades: entrepreneurial process, environmental and external determinants of entrepreneurship, value creation and performance, psychological, cognitive and individual characteristics and entrepreneurial networks. Many of these studies focus on seeking and identifying gaps or opportunities in the market and the nature of the individual who can identify these gaps and use their entrepreneurial characteristics (efficacy, skills and network) to capitalise on those opportunities.

As examples of this type of research, Overall and Wise (2016) referred to entrepreneurial characteristics as the need for achievement, independence, persistence, internal locus of control, personal capabilities, hard work, innovativeness, self-efficacy, and the willingness to take calculated risks. Jumain et al. (2017) undertook a partial least-squares regression using survey results of Malaysian entrepreneurs. The model found that the risk-taking behaviour and self-efficacy of entrepreneurs was associated with business success. Risk-taking and self-efficacy would seem a typical entrepreneurial profile (that often garners media attention), namely an individual prepared to take risks and one with a high degree of self-belief. The work by Jumain et al. (2017) is counter to the theoretical hypothesis of Knight (1921) and work by Hvide and Panos (2014). They propose and find that while risk-taking behaviour may prompt individuals to pursue an entrepreneurial avenue, such risk-taking characteristics do not necessarily lead to business success.

However, not all entrepreneurs are self-confident risk-takers seeking to create and capitalise on opportunities. It is essential to differentiate between opportunist entrepreneurs and individuals driven to business creation because of economic necessity. Minniti, Bygrave and Autio (2006) defined opportunity entrepreneurs as commencing businesses to commercialise an identified opportunity. They defined necessity entrepreneurs as those who are forced into entrepreneurship because they find all other avenues of earning a living unavailable or

dissatisfactory. Valliere and Peterson (2009) suggested that necessity-based entrepreneurship is typically a subsistence business in emerging markets. Necessity-based entrepreneurs may be classified as "self-employed" rather than as "entrepreneurs"; however, this research considers that both opportunistic and necessity-based entrepreneurs meet the broader definition of "entrepreneur". In developed countries, those who find it necessary to seek self-employment as entrepreneurs may fulfil personal preferences that are not always economically motivated.

While the entrepreneurial profile in terms of personality trait is undoubtedly critical as often the entrepreneur "is the business", the desired entrepreneurial qualities may differ depending on the economic environment in which the business operates and the entrepreneur's motivation.

Irrespective of motivation, entrepreneurs require a vast array of competencies to increase the probability of business success or even *just* survival. Although arguably not a glamorous area, a critical business competency infrequently addressed in academic literature is the daily management of business finances. The research into entrepreneurial finance that exists is typically centred around the mechanisms of raising and deploying capital rather than the more "mundane" task of day-to-day accounting or bookkeeping functions. Record keeping tends to pale in comparison to the launch of a new, disruptive technology platform.

Perhaps some of the reasoning for the lack of academic attention on daily operational financial tasks is that entrepreneurial financial *competencies* (which extend far beyond the ability to raise capital) are at an intersection of several fields. Accounting and bookkeeping is a pure commerce domain in which there is extensive research. Entrepreneurship itself is a research category and encompasses business management and psychology elements and influences. When discussing competencies and the attainment of skills, another core research category is the field of education. Thus, academic work in the field of business financial literacy needs to incorporate a blend of commerce, education, humanities, business and entrepreneurship.

Globally, many academic, government-sponsored, or private organisations provide education and training to entrepreneurs. However, these programmes' curricula typically only include the day-to-day, practical financial management knowledge and skills required to run a business as an afterthought. It is distribution, marketing and branding strategies, product development, capital raising, client service and leadership skills that tend to be at the forefront of educational offerings for current and prospective entrepreneurs.

Despite potentially having both the desire and the entrepreneurial training, launching and building a successful business is not an easy path to tread; the attrition rate is high, and many business practitioners fail, sometimes multiple times over. Within the United States, the Small Business Administration Office of Advocacy compiled statistics from the Bureau of Labour

Statistics to show that over 50% of new businesses fail within the first five years (US Small Business Administration Office of Advocacy, 2012). Levie, Don and Leleux (2011) presented findings that interrogated cross-national business persistence rates gathered by the OECD Entrepreneurship Indicators Programme, which agreed with the documented US failure rate. One-year persistence (survival) rates are about 80% on average, while this rate drops to 50% over five years.

Entrepreneurs require a vast array of competencies and ensuring that those individuals who wish to start a business have, among other things, the human capital to do so is critical to enhancing their potential success. Human capital arises from cognitive skills gained from the quality and quantity of education and non-cognitive skills from family and cultural input (Hanushek & Woessmann, 2008). Within an entrepreneurial business sense, this human capital must include practical, financial competencies.

1.2 Business Financial Literacy

If an entrepreneur's human capital and skillset must include practical, financial competencies, what should those competencies encompass? What financial skills and knowledge should an entrepreneur possess? The research described in this thesis introduces the concept of *business financial literacy*. To the best of the researcher's knowledge, business financial literacy is not a term that has been previously proposed, nor an area that has received much investigation. There is, of course, prior work in literacy, financial literacy, education (assessment and test development), business management and accounting topics, all of which inform the study described in this thesis.

Figure 1-1 demonstrates how the various underlying topics that underpin business financial literacy align and scaffold. The presented diagrammatic pyramid has three layers: a foundation layer, a domain-specific layer, and a context-specific layer. Also shown graphically are two dimensions, a basic knowledge "face" and a functional skills "face".

Within the foundational layer, basic knowledge is "scholastic literacy". Scholastic literacy is the ability to read and write, and the foundational numeracy level learned during school years. Coupled with basic knowledge about reading and writing are the functional skills associated with this basic knowledge. An individual may be able to read, but can they interpret and comprehend the written text? They may understand numbers and basic arithmetic, but can they use numerical information computationally to make decisions? As such, functional skills are about the application of knowledge for real-world use.

Financial literacy falls within the domain-specific layer. There is basic knowledge associated with the financial literacy domain; however, that basic knowledge would not be attainable without the underlying scholastic knowledge. Equally, functional skills are associated with financial literacy, namely the practical concepts around the time value of money, budgeting, and saving and investment. Again, those functional domain-specific skills would not be possible without the functional scholastic skills as predecessors.

Finally, within the context-specific layer, at the top of the pyramid, are two specific financial literacy areas presented hierarchically. The first context-specific layer is personal financial literacy; the functional application of personal financial literacy knowledge ensures a lifetime of financial wellbeing (Lusardi & Mitchell, 2005; Hastings & Mitchell, 2011).

A higher-level context-specific layer is business financial literacy. Business financial literacy relies on the foundational scholastic knowledge and skills, the domain-specific financial literacy knowledge and skills and the context-specific personal financial literacy knowledge and skills.

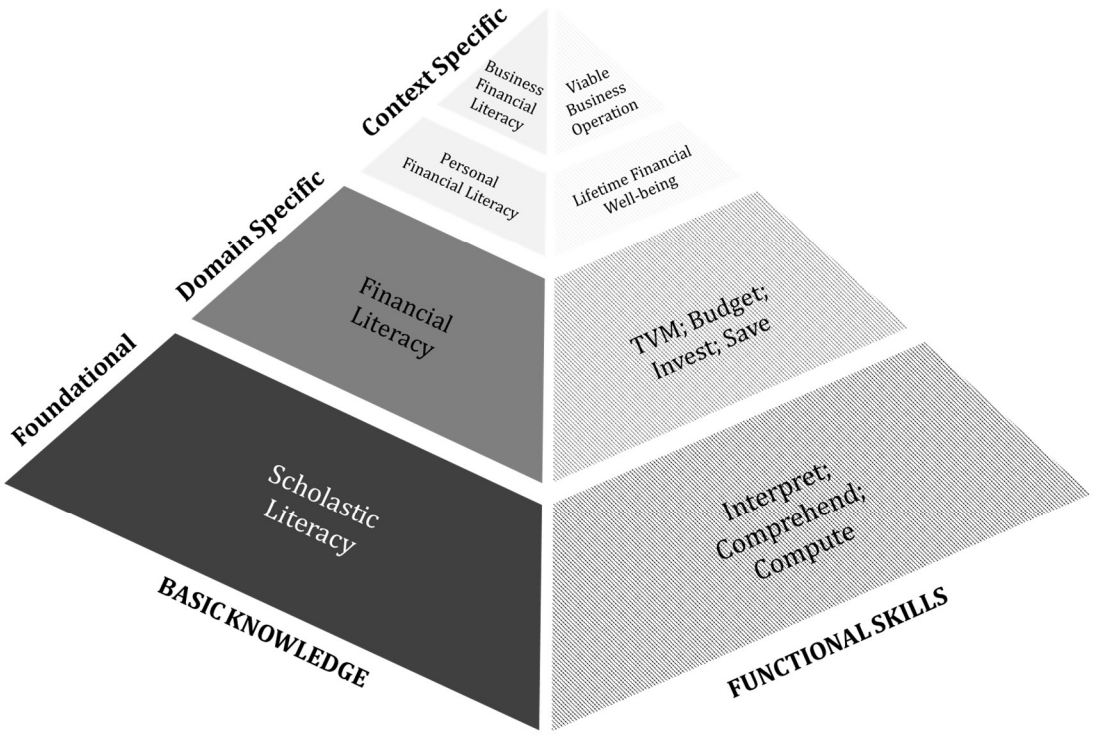


Figure 1-1: Diagrammatic Representation of Thesis Context

Therefore, business financial literacy, which comprises technical and context-specific knowledge, and functional skills, depends on the lower layers. Due to the underlying dependencies, this study incorporates the concepts of literacy and the associated functional skills, much of which has an education component. It also incorporates the financial literacy domain concepts and examines

the large pool of prior research investigating personal financial literacy. Finally, to thoroughly examine business financial literacy, the technical "basic" knowledge must be covered, as well as the functional, skills-based component of operating a viable business. This knowledge and functional business operation skills are grounded in business management and accounting cycle processes and methodology.

Therefore, the context-specific business financial literacy niche must reference the research associated with the underlying layers and address both knowledge and functional skills.

1.3 Problem Statement

Entrepreneurship is critical for economic growth and job creation, and entrepreneurs and business practitioners should be supported to enhance their likelihood of business success. To properly design the right interventions and support, including the associated knowledge and skills that encompass business financial literacy, a test instrument is required to measure business financial literacy levels. Historically, the design of financial literacy test instruments was typically for assessing individual consumers of financial products and not assessing business practitioners. As such, the results and interpretation of these instruments tend to be in the context of ensuring a lifetime of personal financial wellbeing: retirement planning, savings behaviour, use of debt facilities, and investing in financial markets. Financial literacy education programmes use the results to evaluate and shape education content for these individual financial consumers. The OECD/INFE Expert Subgroup Survey of micro, small and medium enterprises (MSMEs) in 21 countries noted that none of the countries participating had a survey instrument formulated to measure the financial literacy of decision makers in MSMEs (Atkinson, 2017).

The inability to measure the financial competencies among individual entrepreneurs embarking upon or running businesses implies an inability to identify those individuals with inadequate financial skills in a business context. Unskilled individuals, lacking in human capital, diminish the likelihood of entrepreneurial or small business success, and the resulting contribution to economic growth (Hanushek & Woessmann, 2008; Engström & McKelvie, 2017).

The need for financially literate business practitioners is a universal objective that is unlikely to be disputed; it stands to reason that those starting a business should have financial skills. However, what is unclear is what those financial skills should be. What should entrepreneurs know? How should they behave, what approach should they take? A financial competencies framework is required to map out the financial competencies for business practitioners to provide a foundation from which financial literacy within a business context is measurable.

In 2018, the OECD/INFE published a Core Competencies Framework on Financial Literacy for SMMEs, to the best of the researcher's investigation, the only such framework currently in existence (OECD, 2018). Although using this framework as a starting point, this study proposes an alternative theoretical financial competencies framework as the base from which to design a test instrument to measure business financial literacy.

A further consideration in designing the proper support and intervention mechanisms for entrepreneurs is understanding entrepreneurs' demographic characteristics associated with differing business financial literacy levels.

As such, this study addresses the following areas: the formulation of a theoretical financial competencies framework for entrepreneurs; the development of a test instrument that measures the business financial literacy of entrepreneurs; and an investigation into the demographic factors associated with differing levels of business financial literacy.

1.4 The South African Case

This study is, in part, an attempt to start to understand the demographic factors associated with different levels of business financial literacy. Thus, while demographic factors have been previously assessed within the personal financial literacy context, no such work has been conducted within the business financial literacy context. This exploratory study was conducted within South Africa to measure entrepreneurs' business financial literacy and review the associated demographic factors. South Africa provides a suitable context for undertaking an exploratory study as the South African economy is a hybrid of developing and developed market environments. There is a mix of necessity-based and opportunistic entrepreneurs, and the demographics are diverse. The diversity of entrepreneurial profiles and business types within the South African market creates a robust test environment; if an instrument can cater to the South African case's complexity, it is likely to withstand implementation challenges in numerous developed and developing markets.

Within a South African context, not only are levels of entrepreneurial activity, while critical to economic growth and job creation low but there is concurrently a personal financial skills shortage. The financial skills shortage was measured and assessed by the OECD/INFE International Survey of Adult Financial Literacy Competencies in 2016, which found that South Africa (together with Albania, Belarus and Thailand) had a distribution of financial knowledge scores that indicated that respondents found it hard to answer the survey's questions. Only 3 out of every 10 South African respondents (30%) answered at least five out of the seven knowledge questions correctly (OECD, 2016a).

The finding of low South African financial literacy levels by the OECD/INFE survey support similar findings from the Standard & Poor's Ratings Services Global Financial Literacy Survey, which measured just 42% of South African adults as financially literate (Klapper, Lusardi & van Oudheusden, 2014).

The 2016/17 Global Entrepreneurship Monitor (GEM)[1] Report on South Africa estimated that Small and Medium Enterprises (SMEs) contributed 36% of 2015 GDP and represented 40% of all business in South Africa (Herrington, Kew & Mwanga, 2017). The South African National Planning Commission appointed in June 2011 was tasked to draft a National Development Plan to construct the roadmap to the elimination of poverty and the reduction of inequality by 2030. As part of their plan, the Commission forecasted that by 2030, 90% of all jobs would come from SMEs (National Planning Commission, 2012). However, despite this ambitious Government target, South Africa's Ease of Doing Business ranking is 84 out of 190 countries surveyed by the World Bank. The Starting a Business ranking, a component of the Ease of Doing Business measure, is 153rd out of 190 countries for South Africa (The World Bank Group, 2020).

As per Levin (2019), the South African small business environment (less than 50 employees) is dominated by informal business (see Figure 1-2). There are estimated to be 1.525 million informal small businesses and 640 thousand formal small businesses country-wide. Within the informal segment, 80% of businesses have no employees (sole traders), versus 25% of formal businesses that operate as sole traders.

As a country, South Africa has ambitious goals for promoting the development and growth of SMEs, yet small businesses fail for the most part due to skills shortages or lack of human capital (Bushe, 2019). With low personal financial literacy levels, which precedes business financial literacy knowledge and skills, South Africans are at a distinct disadvantage if they aspire to start new businesses.

The GEM South Africa Report (2017) identified the reasons for business exit between 2006 and 2016. For the average African business over the time horizon, 41% exited because the business was not profitable, and 17.2% ceased trading because of problems getting finance. A further 17.8% cite personal reasons for exit (Herrington, Kew & Mwanga, 2017).

This researcher suggests that to improve business success, the entrepreneur's skills and aptitude for financial business decision-making and management are critical factors shaping the business outcome.

[1] GEM is a global consortium of researchers and carries out survey-based research on entrepreneurs and entrepreneurship around the world.

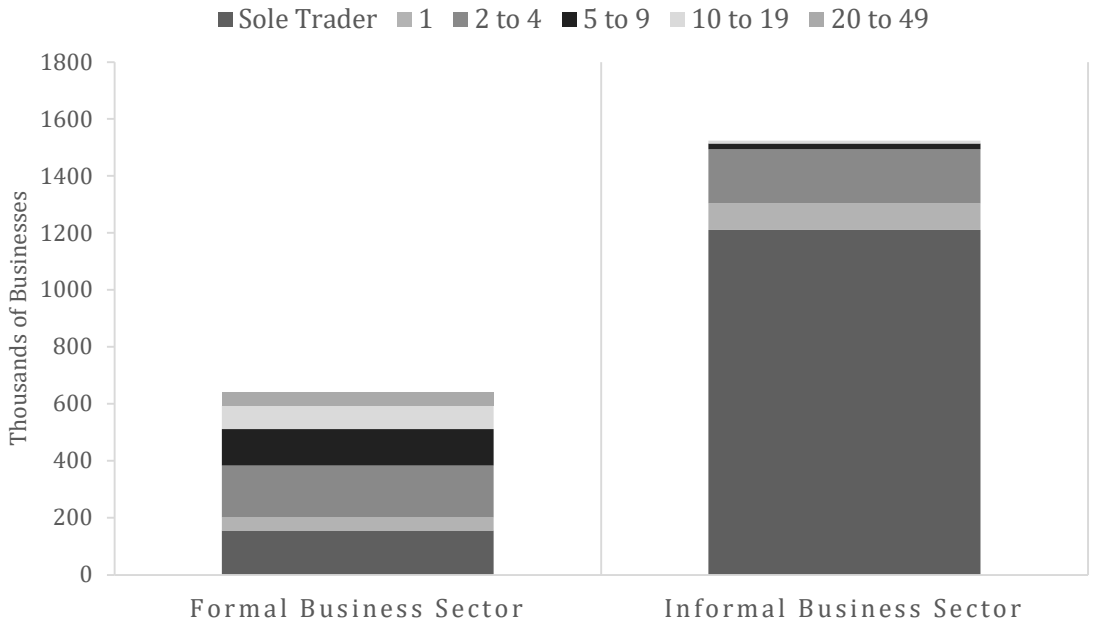


Figure 1-2: South African Small Business by Number Employed - Formal and Informal Sectors, Levin (2019)

1.5 Research Objectives

This study's objective is threefold: firstly, to map out what competencies an entrepreneur or business practitioner should have (knowledge and functional skills); secondly, to use the financial competencies framework to produce a reliable and valid business financial literacy test instrument that accurately measures business financial knowledge, financial behaviour, and financial attitude amongst entrepreneurs. Finally, to use the formulated instrument to undertake an exploratory study in an appropriate market. These three goals led to the formulation of three primary research objectives and several related research questions.

Objective 1: The formulation of a theoretical financial competencies framework for business practitioners.

The framework aims to detail what entrepreneurs across various business sizes should know, how they should behave and what attitude they should have towards their business financial processes to be deemed financially literate.

- How should entrepreneurial businesses and the business cycle be defined?
- What are the critical financial competencies for entrepreneurs?
- Which topics should be covered under the critical financial competencies?

Objective 1 is addressed in Chapter 3, which adapts a competencies framework proposed by the OECD/INFE as the starting point and builds on that framework to map out the required financial business competencies for entrepreneurs across various business sizes.

Objective 2: The construction of a survey instrument to measure the business financial literacy of entrepreneurs.

- How should financial literacy for entrepreneurs be defined?
- What items should be included to measure business financial literacy under the various competencies and topics?

The conceptual competencies framework proposed in Chapter 3 is used to construct a survey instrument using methodologies presented in Chapter 4, Chapter 5 and Chapter 6.

Objective 3: An exploratory study of the business financial literacy of entrepreneurs and associated demographic factors.

- Are the empirical data supportive of a valid and reliable test instrument?
- Do respondents with different demographic characteristics (see below) present differing levels of business financial literacy?
    - *Are there gender differences?*
    - *Are there racial group differences?*
    - *Are there respondent age differences?*
    - *Are there educational attainment level differences?*
    - *Are there business age differences?*
    - *Are there business type differences?*
    - *Are there business size differences?*

Objective 3 gathers exploratory data from a convenience sample of South African entrepreneurs, the results of which are presented in Chapter 7 and Chapter 8.

1.6 Novelty and Contribution

This study contributes to the existing literature in the field of *business financial literacy* and the closely related field of personal financial literacy. It does this by:

- The establishment of an academically grounded theoretical financial competencies framework for entrepreneurs that incorporates the globally applicable accounting cycle together with educational taxonomies

- Initiation of understanding of the demographic characteristics associated with business financial literacy levels using a convenience sample of South African entrepreneurs

As mentioned above, the only other financial competencies framework in circulation for MSMEs is developed by the OECD/INFE. While this study uses a similar broad approach, two material changes are made in developing an alternative, globally applicable version of the framework.

Firstly, this study's theoretical competencies framework uses the accounting cycle as a reference point in developing the content areas. While there are various global accounting standards (US GAAP, IFRS), the accounting cycle is universal. A high-level version of the accounting cycle would comprise the following elements in sequence: source documents, journals, ledgers, trial balance, and financial statements. The accounting cycle forms the architecture underlying the operational business cycle. In contrast, the OECD/INFE framework comprises four broad competencies (choice and use of financial services, financial and business management and planning, risk and insurance, financial landscape) and associated topics per competency. The choice of the accounting cycle rather than discrete topics aligns with more practically orientated business operations, capturing what entrepreneurs actually "do" (or should do) daily in running their businesses.

The second structural departure from the OECD/INFE framework is in the classification of businesses. The OECD/INFE uses a business lifecycle progression to classify a business: basic/informal, starting up/becoming formal, growing, closing. This study proposes an alternative classification structure based on the underlying business' size: sole traders, microbusinesses, small businesses, medium businesses. The rationale for using a business size classification rather than a business lifecycle classification is that many businesses do not move through a lifecycle. Instead, for example, a sole trader may remain a sole trader for many years. It would be challenging to assign this prevalent business form to the "correct" category on a lifecycle classification basis.

This study also makes two changes to the formulation of the resulting survey items (questions). The first item formulation change incorporates an educational structure in the form of Bloom's Revised Taxonomy (Anderson, Krathwohl & Bloom, 2001). Bloom's Revised Taxonomy presents a cognitive process dimension: remember, understand, apply, analyse, evaluate, and create. Remember, understand and apply are used to test factual and conceptual knowledge at lower cognitive process levels, while analyse, evaluate, and create are used to test higher-level skills. The rationale for incorporating an educational taxonomy is that entrepreneurs of differing business sizes require different skill levels; using these educational taxonomy classifications allows researchers to devise items at differing complexity levels suitable for the respondent profile.

A second item formulation change is incorporating a more significant number of items that test the financial behaviour and financial attitude in addition to the respondents' financial knowledge. The conceptual model of financial literacy that incorporates financial literacy dimensions is discussed extensively in Section 2.2.2. However, despite a degree of consensus that financial literacy is multidimensional, many survey instruments remain skewed towards assessing knowledge. While the survey instrument formulated in this study does not evenly distribute items between the three dimensions (knowledge, behaviour, attitude), it is more heavily weighted than most towards behaviour and attitude items.

Another novelty in the test instrument formulation was using proxy financial statement data as images embedded within the survey. For example, an item requiring respondents to compute cash flows presented the data displayed on an accounting cash flow statement. Similarly, data required to compute a gross margin by the respondents was presented as would be seen on an income statement. The researcher is unaware of financial literacy surveys that use domain or context-specific images in this way. Survey items are typically formulated as text only or text designed to be read aloud by a survey administrator. The inclusion of financial statement images introduces a practical, real-world element; the entrepreneurial respondents had to analyse and interpret financial data as they would typically encounter those data.

Finally, this study conducts a preliminary analysis of demographic factors associated with business financial literacy for the exploratory study group. Demographic factors captured in personal financial literacy test instruments typically include gender, age, education level, racial group, and income level factors. This study does not include income level factors of the entrepreneur or financial data from the business but introduces business-specific demographic classifications: business type (goods, services or a combination), size, and age.

This study's findings confirm what has been found in personal financial literacy studies, namely that education plays a critical role in the respondent's financial literacy. However, unlike most personal financial literacy studies, this study finds that gender is not a primary factor when adjusting for the other demographic variables. Instead, within a business financial literacy context, business size and respondent education level are the critical characteristics associated with higher levels of business financial literacy. Race, respondent age, and business age also appear to be largely unrelated to business financial literacy levels when accounting for business size and the respondent's education level.

1.7 Dissertation Outline

This thesis comprises four broad components. The first component, which includes this introductory chapter (Chapter 1), covers a review of the existing literature (predominantly

focused on personal financial literacy (Chapter 2) to establish the context of this study. The second component develops a theoretical business financial competencies framework (Chapter 3) and develops the survey instrument (Chapter 4). Also covered are the steps and considerations before instrument administration (Chapter 5), including the empirical tests of instrument reliability and validity (Chapter 6). The third component presents (Chapter 7) and analyses (Chapter 8) the results obtained from the instrument's administration and implementation within the South African environment. Finally, the study concludes (Chapter 9). Figure 1-3 below presents a visual representation of the structure of this thesis.

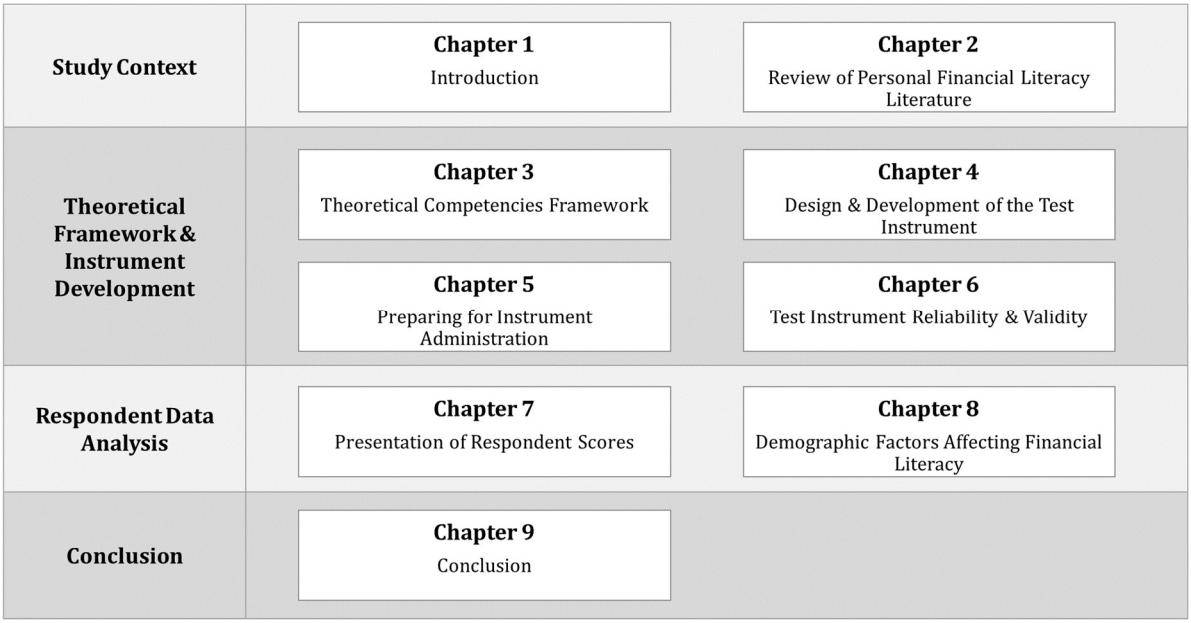


Figure 1-3: Structure of the Thesis

Chapter 2 Literature Review

2.1 Introduction

This chapter formalises the concept of financial literacy and covers the definition, conceptual models and test instruments in circulation and the findings from those instruments' global administration. The review of prior literature and the limitation of the presented conceptual models is that previous research deals with financial literacy research focused almost exclusively on individual consumers rather than financial literacy within a business context, in large part because academic literature on the latter, a vastly under-researched area, is as yet virtually non-existent.

However, while this study developed an instrument to measure the business-specific financial literacy of entrepreneurs operating businesses, rather than the personal financial literacy of individual financial consumers, the definitions and conceptualisations of financial literacy as a domain, the characteristics of both the survey instruments and the respondent data, all remain applicable and transferrable to an entrepreneurial respondent group.

2.2 What is Financial Literacy?

In the most colloquial terms, being financially literate tends to mean "being good with money" and is associated with "living within your means", "sticking to budget", and "planning for the future". A standardised definition of financial literacy is still a work-in-progress but broadly encompasses a level of financial knowledge or education and the associated financial behaviour.

Before 1997 the term "financial literacy" was found very infrequently in the academic research domain; however, there were numerous studies conducted on the propensity of individuals to save and on the factors behind the decline in household-saving observed in the United States (US) (Browning & Lusardi, 1996; Parker, 1999).

The research landscape began to change with the formulation of the Jump$tart Coalition in December 1995, which had the primary aim to improve the finance skills of K-12 American high school students. To have some quantifiable output, the Jump$tart Coalition constructed a survey instrument to measure financial literacy. Due to the poor baseline results, the Jump$tart Coalition decided that the Personal Financial Survey would be administered every two years and forecast that 10-years post the baseline measure, they would conduct a final 2007/08 survey. The ten years of surveys would, they optimistically hoped, document a steady improvement in young Americans' financial literacy levels (Mandell, 2008).

Financial educators, policymakers and other government agencies initially focused principally on financial knowledge as a critical skill for financial consumers. They felt that in an increasingly complex financial marketplace where the burden of financial security was being shifted to individual consumers, being "well-informed" and knowledgeable was important. Financial consumers who were knowledgeable would make informed choices and be essential to creating an efficient and effective financial marketplace (Hilgert, Hogarth & Beverly, 2003).

In 2003, the Organisation for Economic Cooperation and Development (OECD) established the Financial Education Project as its member countries became progressively interested in their citizens' financial literacy (OECD Publications and Information Centre, 2005).

This focus and intent by the OECD further catalysed the research interest in financial literacy, and together with the inclusion of a specific survey module on planning and financial literacy for the 2004 Health and Retirement Study (Lusardi & Mitchell, 2005), academic work and work conducted on behalf of various global and regional organisations began to flourish.

The number of studies examining individuals' financial knowledge, capabilities, and behaviour has grown significantly over the last 15 years. Stolper and Walter (2017) created a metric of papers containing the terms "financial literacy" or "financial knowledge" in their title as of March 2016. Between 2002 and 2004, they found roughly one paper per year meeting their title criteria, but this had increased to approximately 26 papers per year between 2013 and 2015. A similar study has more recently been undertaken by Goyal and Kumar (2021) with 90 papers meeting their screening criteria published in 2019 following the publication of 73 papers in 2018. However, despite the increase in published work, no standardised definition of financial literacy currently exists.

Moreover, in a review of studies on financial literacy conducted prior to 2009, Hung, Parker and Yoong (2009) found a broad range of conceptual definitions, and that many authors did not provide or define a conceptual model of financial literacy in their work.

Similarly, in another review of previous literature, Huston (2010) reported that the majority (72%) of the 71 studies reviewed did not include a definition of financial literacy and that many studies use the terms "financial knowledge" and "financial literacy" interchangeably.

2.2.1 Organisational Definitions of Financial Literacy

As organisational bodies began to tackle financial literacy, they sought to define classifications of individual financial literacy. However, the work to define financial literacy was not globally centralised, leading to multiple definitions emerging. Initially, governmental or government-affiliated organisations, rather than individual authors and researchers, developed, articulated,

and formally defined financial literacy. Discussed below are some of the definitions developed by key bodies.

Kempson, Collard and Moore (2005), in their work assessing financial capability in the United Kindom (UK) on behalf of the Financial Service Authority (FSA), used the term "financial capability" rather than financial literacy but incorporated the definition of Mason and Wilson (2000), as follows:

> "Financial literacy could, therefore, be defined as an individual's ability to obtain, understand and evaluate the relevant information necessary to make decisions with an awareness of the likely financial consequences" (Kempson, Collard and Moore, 2005).

The authors chose to adopt three financial capability components: financial knowledge and understanding, financial skills and competence, and financial responsibility. They suggested that financial capability encompasses the process of acquiring financial knowledge and the behavioural outcomes of those skills.

The terms "financial capability" and "financial literacy" are still used relatively interchangeably within the literature. In this study, the term financial literacy rather than financial capability is used, but the researcher agrees with incorporating financial behaviours beyond financial knowledge into a definition.

Using the definition adopted by the Jump$tart Coalition in 2008, the President's Advisory Council on Financial Literacy (PACFL) defined financial literacy as:

> "The ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial wellbeing" (President's Advisory Council on Financial Literacy, 2008).

Remund (2010) made the point that this definition is lacking several key components. Thus, it is not clear from the definition that financial literacy is a measure or that financial literacy levels themselves are measurable and comparable. It also does not include those financial concepts, or content items, without which an individual cannot be considered financially literate. Finally, Remund (2010) suggested that a definition of financial literacy should also emphasise financial planning and decision making.

In 2003, the Washington State Department of Financial Institutions (DFI) sponsored a survey of the financial literacy of Washington State residents; while financial literacy was not explicitly defined, the report states that:

> "…financial literacy cannot be determined from simple, isolated measures of knowledge, experiences, or behaviours. Rather, a comprehensive depiction of an individuals' financial literacy, as an indicator of competency, must include more complex analysis of these

> factors in aggregate. Financial knowledge, experiences, and behaviours are linked in a relational way. Financial experiences and behaviours together contribute to financial knowledge levels and gains in competency." (Moore, 2003)

In 2009, supported by the PACFL, the US Financial Industry Regulatory Authority (FINRA) Investor Education Foundation conducted the National Financial Capability Study (NFCS) for the first time. The NFCS sought to gain similar insight into American citizens' financial *capability* as achieved in the United Kingdom.

The NFCS focused on four financial capability elements: making ends meet, planning ahead, managing financial products, and financial knowledge and decision making (Mottola & Kieffer, 2017). Although the NFCS articulated the elements they believed demonstrated financial capability, they did not provide a formal definition of financial capability.

In 2008, the OECD established the International Network on Financial Education (INFE) to facilitate sharing information, measurement, analysis, and the development of policy and programmes to address financial literacy.

The OECD/INFE definition of financial literacy is:

> "A combination of awareness, knowledge, skills, attitude, and behaviours necessary to make sound financial decisions and ultimately achieve individual financial wellbeing." (OECD, 2015)

This definition incorporates four dimensions of financial literacy: knowledge, skills, attitude, and behaviours. Unlike the President's Advisory Council definition, it includes the concept of financial decision-making with the end objective as financial wellbeing. Using Remund's (2010) critique of the PACFL definition, this formulation by the OECD/INFE also omits the concept of financial literacy being a measurable quantity, and it does not include critical content item competencies.

In 2012, the Programme for International Student Assessment (PISA), in addition to its core assessment modules focussed on reading, mathematics, and science, included a financial literacy section to measure young (15-year old) people's financial literacy levels.

PISA defined financial literacy as follows:

> "Financial literacy is knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial wellbeing of individuals and society, and to enable participation in economic life." (OECD, 2017).

Thus, the OECD/PISA believes financial literacy depends on knowledge and understanding, skills (including basic numeracy and cognitive processing), attitude and application, with the ultimate objective of improved financial wellbeing. The knowledge and understanding dimension includes four content areas: money and transactions, planning and managing finances, risk and reward, and financial landscape (OECD, 2017).

Table 2-1 summarises the various organisational definitions of financial literacy (or financial capability) discussed above.

Over time, definitions of financial literacy have expanded beyond understanding and knowledge to include a practical component. This practical or outcomes-based component was what Kempson, Collard and Moore (2005) sought to emphasise through their use of the term "financial capability" rather than "financial literacy". The ability to "make decisions" or incorporate a "skills" component suggests that knowledge by itself is insufficient and that individuals need to be able to apply their knowledge for their financial betterment.

The OECD/INFE and subsequent PISA study extend the concept of knowledge and skills to include attitude. Specifically, the PISA study specifies the attitude components as "motivation" and "confidence" to apply the knowledge.

However, the lack of "planning" as an explicitly defined concept within the above list of financial literacy definitions is noticeable. Numerous financial literacy survey instruments and studies tend to focus heavily on individuals' propensity to plan and stick to the plan, even though the term "planning" is generally not included in definitions of financial literacy.

Arguably, while Remund (2010) is correct that the content areas included within the definition of financial literacy should be specified, the specification of the content areas should form part of a second-tier definition so as not to dilute the core elements in "the headline definition". Unfortunately, this second-tier specification is often missing or not explicitly stated in studies. Similarly, the formal inclusion of measurability is perhaps dilutive to a formal definition. However, there is sufficient research and academic precedent to accept that financial literacy is a measurable quantity. Defining "what" is measurable is of more value. Further, the absence of a definition or conceptual model makes it difficult to compare results across financial literacy surveys, as the tested competency is not always clear.

The sections below provide a review of those academic works that include a conceptual model, which is suggested is the first step in formulating what it means to be financially literate.

Table 2-1: Summary of Organisational Definitions of Financial Literacy

Organisation	Region	Year	Understanding / Knowledge	Skills	Make Decisions/ Behaviours	Attitude	Comment
Washington State DFI	US	2003	x		x		No formal definition.
FSA	UK	2005	x	x	x		"Evaluate" is equated with "skills."
Jump$tart/PACFL	US	2008	x	x			"Manage" is included in the definition that may be equivalent to "make decisions."
OECD/INFE	Global	2008	x	x	x	X	"Awareness" included, which is an attitude rather than behaviour. "Behaviour" explicitly included.
NFCS	US	2009	x		x		No formal definition.
PISA	Global	2012	x	x	x	x	Specific attitude traits included, namely "motivation" and "confidence".

2.2.2 Evolution of Conceptual Models of Financial Literacy

Miles, Huberman and Saldaña (2014) defined a conceptual framework as a visual or written product that explains the primary elements studied, graphically or in story form, including the critical factors, concepts or variables, and the supposed relationships between them. This study proposes that financial literacy is a multidimensional concept and that the underlying dimensions are related to each other. Some previous authors have presented their financial literacy conceptualisations graphically, including the underlying dimensions and the relationship between those dimensions.

2.2.2.1 Two Dimensional Conceptualisations

Huston (2010) conceptualised financial literacy as having just two dimensions. The two proposed dimensions are: knowledge and application, and the author stated that a definition of financial literacy involves the measurement of both the understanding (knowledge) and use (application) of finance-related information by an individual. Huston also included the "confidence to use financial knowledge" within the application dimension. Thus, attitude (confidence) and skills (use of financial knowledge) are sub-components of the application dimension in this conceptual model. The knowledge dimension is presented as impacting the application dimension, but it is shown as a one-directional relationship.

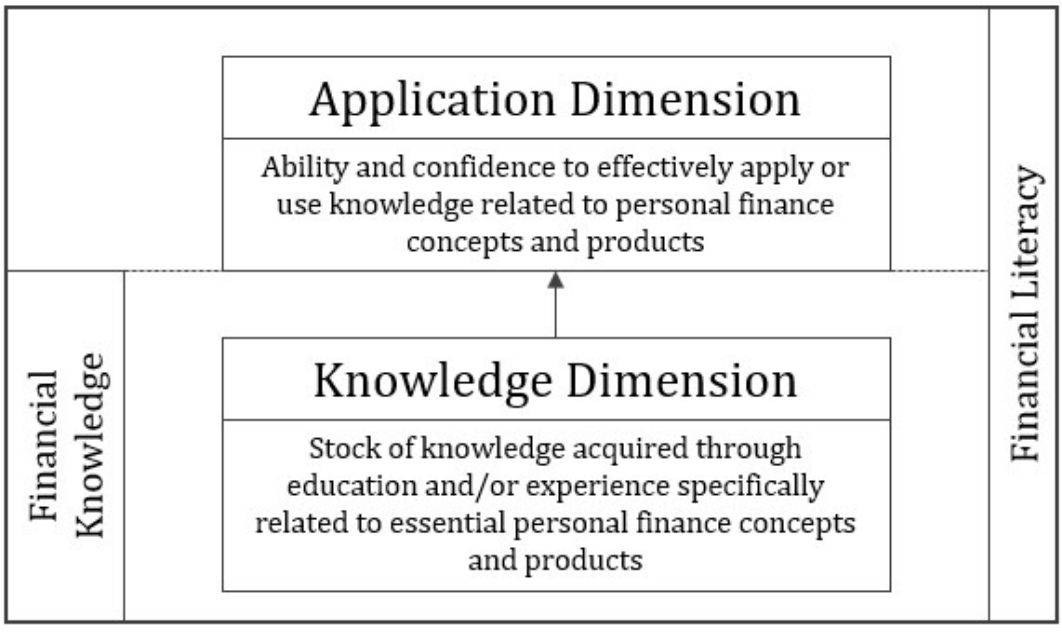


Figure 2-1: Conceptual Model of Financial Literacy - Huston (2010)

Huston's conceptualisation of a two-dimensional financial literacy measure is clear and straightforward. It allows for a focus on knowledge and applying that knowledge, incorporating

the application dimension's behavioural elements. However, it is proposed that financial behaviour (included in Huston's application dimensions) shapes financial knowledge. As such, conceptual models should indicate financial behaviour and financial knowledge influencing each other in both directions, not merely a one-directional relationship.

To provide an example of the relationship between financial behaviour and financial knowledge, consider negative financial behaviour - for instance, an indebted consumer not settling an interest payment timeously. The financial institution (lender) then charges the individual late settlement penalties, thus "educating" them about the consequence of their poor financial behaviour and increasing the consumer's financial knowledge. The consumer now knows more about the fine print of their borrowing facility. In a rational world, knowledge of these penalties would then shape subsequent financial behaviour and the individual consumer would seek to avoid these fees by timely payment in the future.

While there is a correlation between knowledge and behaviour, Hilgert, Hogarth and Beverly (2003) emphasised that this correlation does not mean that improved knowledge drives improved financial behaviour. They suggested that consumers may gain knowledge by practising good behaviour, like saving for the future; thus, improved behaviour also drives improved knowledge. The OECD/INFE international survey also found an association between financial knowledge and financial behaviour. However, their determination of causality ran counter to Hilgert, Hogarth and Beverly (2003). Thus, they found that those respondents with higher levels of financial knowledge were more likely to practise good financial behaviours (Atkinson & Messy, 2011).

Many research papers have debated whether having financial knowledge increases the ability or likelihood of proactive and practical financial decision making and planning. Consumers with more financial knowledge tend to practise "good" financial behaviours, such as paying bills on time and having emergency savings. Prior findings that there is an interlinked relationship between financial knowledge and financial behaviour support the view that the two dimensions reinforce each other irrespective of the direction of causality.

2.2.2.2 Three Dimensional Conceptualisations

Hung, Parker and Yoong (2009) suggested a three-dimensional conceptualisation of financial literacy, namely: knowledge, skills, and behaviour, as well as their mutual relationships. Therefore, these authors proposed incorporating all three dimensions and the dependencies between them to conceptualise financial literacy. Thus, they propose that financial knowledge is shown in perceived knowledge, where perceived knowledge is a metric of what individuals think

they know (a subjective measure of knowledge) compared to what they actually know (an objective measure).

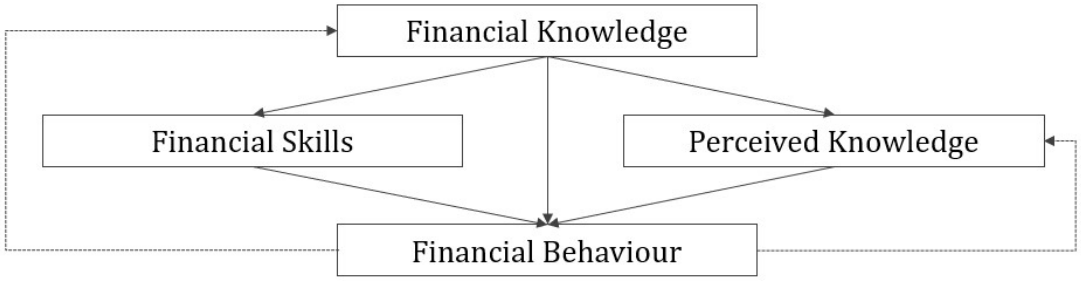


Figure 2-2: Conceptual Model of Financial Literacy - Hung, Parker and Yoong (2009)

The above model proposed that financial knowledge directly shapes financial behaviour and impacts both financial skills and perceived knowledge. Building on the model of Hung, Parker and Yoong (2009), it is proposed that perceived knowledge may reflect the attitude of the respondent. Confident individuals are likely to suppose that they have a high level of knowledge. Financial behaviour, as per the model of Hung, Parker and Yoong (2009), then, in turn, influences subjective knowledge and objective knowledge but not their financial skills dimension.

While perceived knowledge, not specified as a dimension of financial literacy by Hung, Parker and Yoong (2009), was included within their conceptual model of financial literacy, they did not propose how perceived knowledge should be measured. Their research then evaluated the empirical reliability of knowledge-based financial literacy instruments developed by other authors; as such, neither their definition nor conceptual model was utilised in the construction of a test instrument.

Stemming from concern about financial education and the levels of consumer debt in particular, in the UK, in 2004, the FSA commissioned a thorough survey to determine the UK's standard of financial capability (Kempson, Collard and Moore, 2005).

The FSA model of financial literacy graphically displays the inter-relatedness of three dimensions: knowledge and understanding, skills, and confidence and attitudes. However, they reflect two higher-level inputs into their three dimensions: experiences and circumstance and personality. Experiences with financial products or life circumstances influence knowledge and understanding and the acquisition of skills. Experience also impacts confidence and attitude towards financial products. The individual's inherent personality traits shape how they respond to the experience, and their confidence and attitude, together with their knowledge and understanding and skills, feed into their behaviour. Therefore, behaviour is represented not as a dimension of financial capability but as the outcome of financial capability.

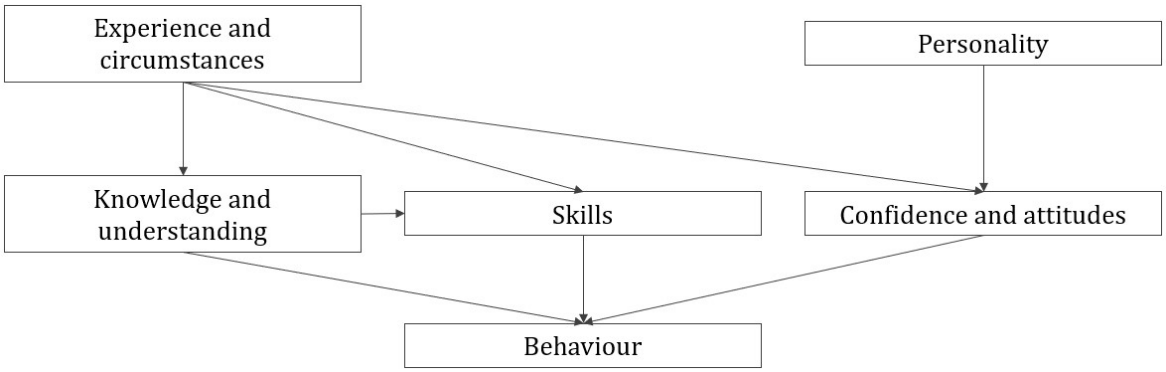


Figure 2-3: Conceptual Model of Financial Capability - Kempson, Collard and Moore (2005)

As discussed in Section 2.2.2.1, the conceptualisation of Kempson, Collard and Moore (2005) and Huston (2010), in which behaviour is not graphically shown to impact knowledge or attitudes, can be questioned.

In their work to validate the Financial Literacy Study (FILS) designed for German adolescents, Schuhen and Schürkmann (2014) generated a theoretical financial literacy model, emphasising the testing of financial literacy as a competency distinct from mathematical or economic competence. These authors broke their conceptual model into three levels rather than dimensions: a content level, a competence construction level and a personal level. The first level (the content level), like that of Titko, Lace and Polajeva (2015) (see Figure 2-6), identified the specific tested content areas (debt, the creation of wealth, insurance and taxes, monetary transfer, monetary policy). In the second level (competence and construction), tasks were posed to the survey respondents that involved them assuming different roles to deal with specific problems. The final level was the personal level, which included questions about attitude and motivation.

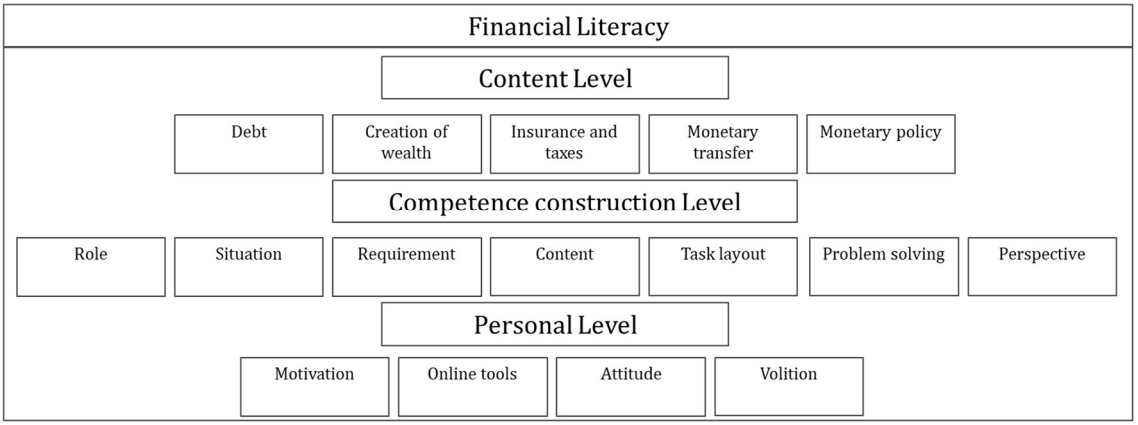


Figure 2-4: Conceptual Model of Financial Literacy - Schuhen and Schürkmann (2014)

However, while Schuhen and Schürkmann's (2014) model includes objective knowledge in the content level, skills and ability in the competence level, and attitudes at the personal level, thus

potentially aligning with other three-dimensional conceptualisations, there is no graphic representation of the potential relationship or interaction between the levels (dimensions).

Henager and Cude (2017) examined the relationship between financial literacy and financial behaviour in various age groups using a modified version of Huston's (2010) conceptual model. Huston (2010) used financial wellbeing as the outcome, whereas Henager and Crude (2017) focused on financial behaviour to test their hypotheses on long-term and short-term financial behaviour.

Their definition of financial literacy included objective knowledge and ability using Huston's two-dimensional approach, but they also included a third dimension, subjective (or perceived) knowledge. They termed this perceived knowledge "confidence", again aligning subjective knowledge with an attitude dimension.

Therefore, while the authors reference Huston's work for their model input, their conceptual model is more akin to the model proposed by Hung, Parker and Yoong (2009). However, it excludes the concept of financial behaviour influencing financial knowledge, even though the authors found that objective financial knowledge and subjective financial knowledge (attitude) were positively associated with financial behaviour.

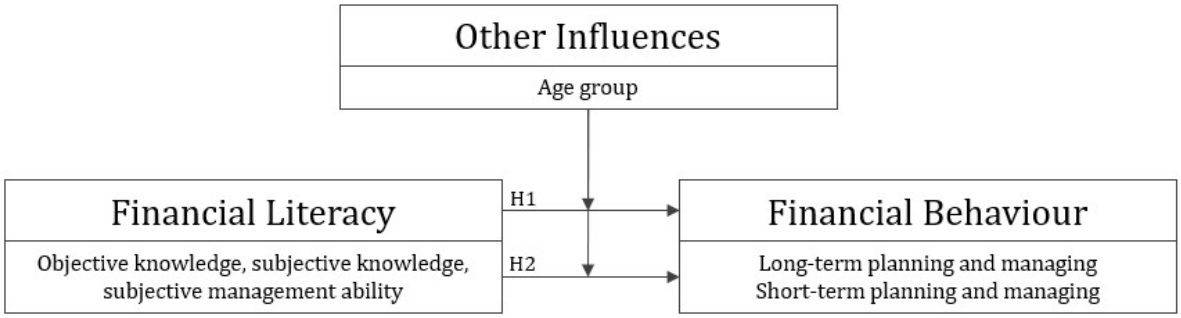


Figure 2-5: Conceptual Model of Financial Literacy - Henager and Crude (2017)

2.2.2.3 Multidimensional Conceptualisations

A conceptual model that presented a circular relationship between four dimensions of financial literacy was formulated by Titko, Lace and Polajeva (2015), who developed a financial literacy instrument to measure financial literacy levels in the Baltic states of Latvia, Estonia, and Lithuania. Based on content analysis of the term "financial literacy" in research papers, these researchers expressed their results in a diagrammatic conceptual model, as shown below.

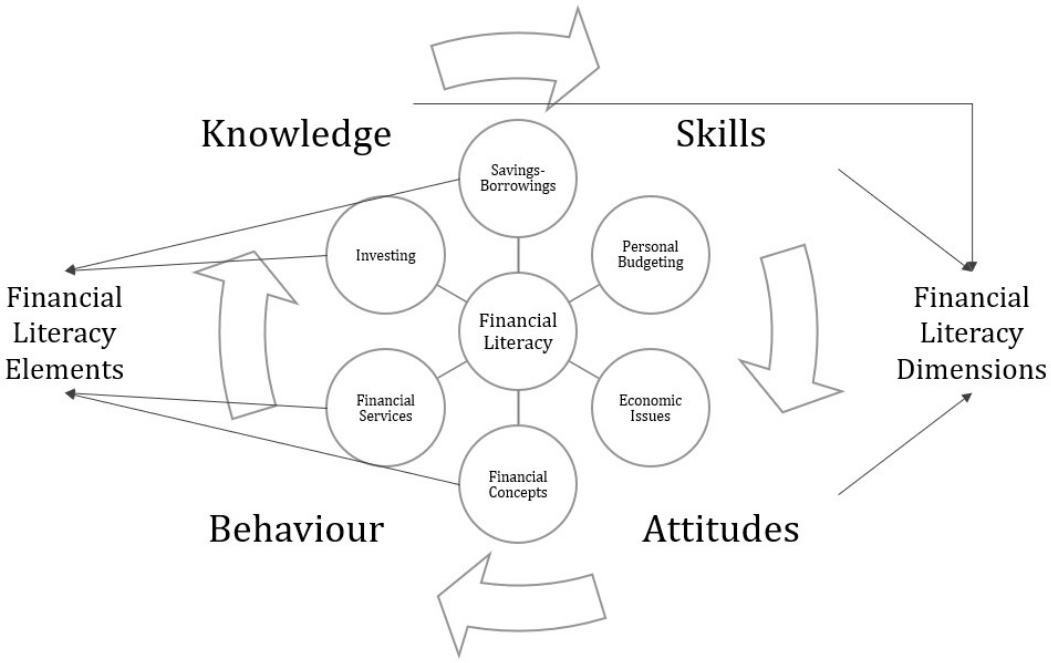


Figure 2-6: Conceptual Model of Financial Literacy - Titko, Lace and Polajeva (2015)

These researchers adopted a model similar to that proposed by Hung, Parker and Yoong (2009) but included a fourth dimension: attitudes. Unlike many prior models, they decomposed the content areas as part of their conceptual model and graphically specified the elements of financial literacy included in their survey instrument (savings-borrowings, personal budgeting, economic issues, financial concepts, financial services, and investing).

However, although Schuhen and Schürkmann (2014) also decomposed their content areas (Figure 2-4), there is no clear or distinct alignment with the content areas proposed by Titko, Lace and Polajeva (2015). The misalignment between dimensions and content areas further demonstrates that while multiple authors may intend to test financial literacy, they do so in a non-homogenous manner. As a result, comparing the scores from one test with another is potentially misleading, as they may indicate very different literacy levels.

Focussing on the "roots" of financial literacy, Grohmann, Kouwenberg and Menkhoff (2015) sought to evaluate the link between childhood variables, financial literacy and financial behaviour. In their conceptual model formulation, these authors included numeracy as an additional separate construct and defined childhood variables as parental education, financial socialisation by parents, economics at school, educational quality and financial socialisation through experience with money and work.

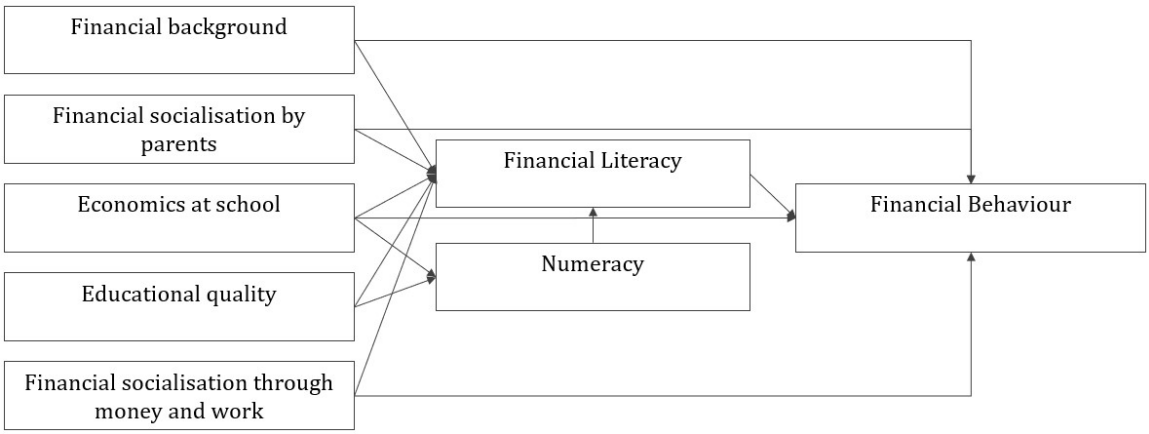


Figure 2-7: Conceptual Model of Financial Behaviour - Grohmann, Kouwenberg and Menkhoff (2015)

These authors found that financial literacy was positively influenced by parents' financial socialisation, economics at school, and educational quality and further suggested that financial literacy and financial behaviour may be highly contingent upon personality (financial attitude). However, financial behaviour was again not reflected as influencing financial knowledge but was instead graphically presented as a one-directional relationship from knowledge to behaviour.

2.2.2.4 Discussion of Conceptual Dimensions

Just as there is no standard definition of financial literacy, there is no generally accepted conceptual model. Potrich, Vieira and Mendes-Da-Silva (2016) sought to test three varieties of financial literacy model constructs using the three dimensions proposed by Atkinson and Messy (2011): financial knowledge, financial behaviour, and financial attitude.

Model 1, as shown diagrammatically below, indicated financial knowledge and financial attitude as precursors to financial behaviour. In other words, an improvement in financial behaviour is preceded by improvements in financial knowledge, while financial attitude and financial behaviour are not shown as influencing financial knowledge. Model 2 displayed financial literacy as a combination of the three dimensions, but still with no graphical relationship between the dimensions presented. Model 3 proposed that financial literacy was a unique construct formed by the three selected dimensions: financial knowledge, attitude, and behaviour.

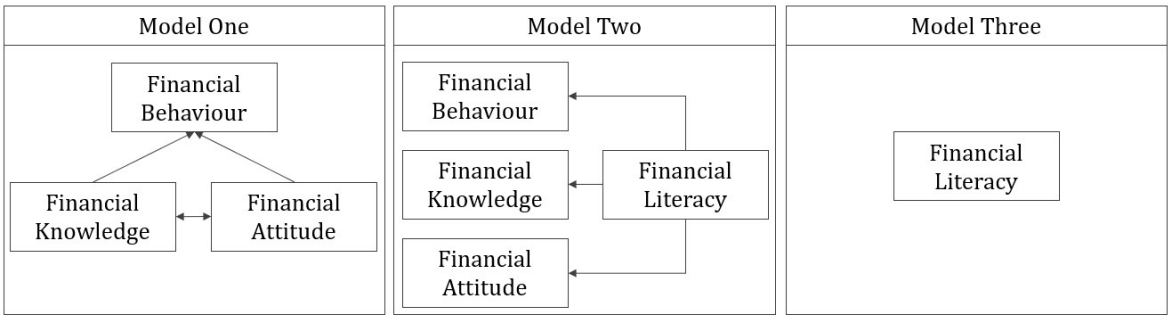


Figure 2-8: Conceptual Models of Financial Literacy - Potrich, Vieira and Mendes-Da-Silva (2016)

Based on data from the responses of 534 Brazilian students to their survey questions, these researchers found, similarly to Hilgert, Hogarth and Beverly (2003), Atkinson and Messy (2011) and Grohmann, Kouwenberg and Menkhoff (2015), that financial knowledge and attitude influenced financial behaviour as indicated by Model 1. Models 2 and 3 were deemed inadequate.

However, in evaluating the proposed conceptual models using Structural Equation Modelling (SEM), the authors materially reduced the question items in each dimension of the survey instrument. For instance, although the financial behaviour category contained 20 items, only five items were included, while the financial attitude items ultimately only comprised four of the original nine questions. The number of excluded content items suggests that the question items themselves required further consideration and refinement before any generalised conclusions could be drawn about the financial literacy construct. However, this research does provide support for the notion that financial literacy is a multidimensional concept.

The table below summarises the conceptual models discussed. All conceptualisations of financial literacy include the financial knowledge dimension, and most models include financial skills, application or ability. Financial attitude and financial behaviour are presented as two distinct dimensions of financial literacy, and both are included in the models of Kempson, Collard and Moore (2005), Titko, Lace and Polajeva (2015), Potrich, Vieira and Mendes-Da-Silva (2016) and Henager and Crude (2017).

Interestingly, although these are conceptual models of financial literacy, many models indicate financial behaviour as the endpoint rather than financial literacy itself. Two of the models are circular, namely that of Hung, Parker and Yoong (2009) and Titko, Lace and Polajeva (2015). Moreover, only two models, that of Schuhen and Schürkmann (2014) and Titko, Lace and Polajeva (2015), reference content areas as part of financial literacy conceptualisation.

Table 2-2: Summary of Conceptual Models of Financial Literacy

Authors	**Year**	**Dimensions**						**Content Areas**	**End Dimension**
		Financial Knowledge (objective)	Perceived Knowledge (subjective)	Skills/Application/Ability	Financial Attitude	Financial Experience	Financial Behaviour		
Kempson, Collard, Moore	2005	x		x	x	x	x	n	Financial behaviour
Hung, Parker, Yoong	2009	x	x	x			x	n	n/a (circular relationship)
Huston	2010	x		x				n	Financial literacy
Schuhen, Schürkmann	2014	x		x	x			y	Financial literacy
Titko, Lace, Polajeva	2015	x		x	x		x	y	n/a (circular relationship)
Grohmann, Kouwenberg, Menkhoff	2015	x			x			n	Financial behaviour
Potrich, Vieira, Mendes-Da-Silva	2016	x			x		x	n	Financial literacy
Henager, Crude	2017	x	x	x				n	Financial behaviour

This summary supports the findings by Hung, Parker and Yoong (2009) and Huston (2010) that there is wide dispersion in conceptualisations of financial literacy. Thus, there are various conceptual models and also a range of definitions of financial literacy.

There is, however, a degree of consensus that the financial literacy construct is multidimensional. However, a limitation in the field of financial literacy research is the lack of standardisation across conceptual models which makes the cross-comparison of financial literacy scores challenging. While all models include the financial knowledge dimension, the categorisation and degree of influence of financial behaviour, financial attitude (sometimes referred to as subjective knowledge) and concepts such as skills and ability are still undergoing refinement by various researchers.

This study adopts a three-dimensional conceptualisation of financial literacy in which the dimensions reinforce each other. The conceptualisation is presented and discussed in Section 3.5.3.

The following section provides an overview of the various financial literacy survey instruments and associated studies that sought to measure financial literacy at the domain level or context-specific personal financial literacy rather than business financial literacy.

2.3 Existing Financial Literacy Instruments

Regardless of the definition or conceptual model, financial literacy is typically measured via a survey measurement instrument. Initially, financial services industry practitioners rather than academic institutes conducted early surveys to measure and assess financial knowledge levels, as applied to personal financial management.

In 1993 the Institute of Certified Financial Planners conducted a survey of Certified Financial Planners who confirmed that a lack of investment knowledge was a persistent problem amongst their clients. In 1995 a survey was conducted by auditing firm KPMG found that employees under-contributed a portion of their income to their 401K (defined contribution) plans, thus missing out on tax and investment benefits. Similarly, in 1995, the Employee Benefits Research Institute (EBRI) surveyed workers and found them saving insufficient amounts in their retirement funds and having a false sense of confidence about their financial security. In 1996, Princeton Survey Research Associates interviewed US investors and found only 18% to be financially literate, while in 1997, Vanguard Group/Money Magazine surveyed US mutual fund investors and found the average score on a 20-question quiz to be just 45% (Volpe et al., 1996).

While the surveys conducted in the mid-1990s confirmed that financial knowledge levels among individual US consumers of financial services were low, none of the survey instruments could be

considered rigorous in their design. Moreover, none sought to understand how an individual's financial knowledge translated into their financial decision-making capabilities.

One of the early research surveys of financial literacy undertaken by university academics was that of Chen and Volpe (1998). In this study, these researchers undertook to examine three issues: firstly, a measurement of financial literacy levels among US college students; secondly, an understanding and analysis of the factors leading to the variance in financial literacy levels in their survey sample; and, thirdly, an examination of how financial knowledge influences the opinions and decisions of the sampled students.

This early work is critical to reference as a methodological benchmark in financial literacy research, and a few elements of the study are worth noting. The authors acknowledged the importance of a rigorous test instrument and took steps to ensure its consistency and validity. Using independent demographic and respondent background details, an attempt was made to understand what factors lead to the variance in financial knowledge among the test group. Additionally, this early study began to incorporate behavioural components and distinguish between respondents' intentions and actions. While this work did not define financial literacy or propose a conceptual financial literacy model, it was a step forward in academic research.

There are currently many financial literacy survey instruments and associated studies in global circulation and applying a wide range of conceptual models and definitions of financial literacy. In addition to the diversity of definitions, some studies are not based on any formal model or definition. However, even those studies that do not provide a definition or conceptual model tend to focus on at least two dimensions of financial literacy. While there is no consensus on the dimensions of financial literacy, this study adopts the three dimensions of financial literacy categorised in the OECD/INFE International Survey of Adult Financial Literacy Competencies as a framework, namely: financial knowledge, financial behaviour, and financial attitude. The inclusion of behaviours and attitudes by the OECD/INFE and in this research is aligned with the work of Kempson, Collard and Moore (2005), who sought to measure financial capability as a broader definition than financial literacy, which could capture the skills, experience and background of the respondent (Atkinson et al., 2007). The selection of these dimensions is discussed further in Section 3.5.3.

The following sections present a history of test instruments that address financial knowledge, financial behaviour and financial attitudes. The sections present the material loosely in chronological order and establish a foundation from which to originate and implement a new survey instrument. The final Section 2.3.4 provides comments on the discussed instruments and outlines the approach taken in this study.

2.3.1 Financial Knowledge Instruments

One of the earliest surveys focused on measuring financial knowledge was the Jump$tart Coalition survey, administered to US 12th grade students since 1997 (Mandell, 2008). Based on how many questions the respondent answered correctly, they were deemed financially literate or not. The initial survey results painted a relatively bleak picture of final-year US high schoolers' financial acumen; the average overall test score was determined to be 57.3%, under the study-selected passing grade of 60%. Thus, the interpretation of this low knowledge level was that, on average, the survey respondents had not mastered the skills required to make sensible financial decisions.

Lusardi and Mitchell (2005) designed their financial literacy questions to test the inputs required by an individual to maximise their expected utility over their lifetime. Utility maximisation is an economic theory underpinned by the Lifecycle (LC) theory of saving proposed by Modigliani and Brumberg in 1954 [2]. The Lifecycle theory is described by Lusardi and Mitchell as the "workhorse" of economic theory to understand consumption and savings decisions. Ultimately, they wanted to understand why some individuals are better than others at planning for their future.

For an individual to optimise consumption and savings, they must have an expectation of their life expectancy, the discount rate, investment returns, gross and net earnings, pension benefits and inflation. Therefore, a great deal of financial knowledge is theoretically required to achieve the correct balance between savings and consumption. Additionally, an individual would also need the ability and tools to act on this knowledge to successfully navigate the complex decisions of saving sufficiently, investing appropriately, and effectively drawing down on their retirement assets.

Brevity was a guiding principle promoted by Lusardi and Mitchell, and this is an appropriate objective of any survey instrument. Ideally, a survey uses the least number of question items to generate the desired explanatory output.

Combining brevity with their underlying theory of individual consumption and savings, the module inserted into the 2004 HRS wave included just three questions testing financial knowledge and comprehension:

1. *"Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? More than $102; Exactly $102; Less than $102; Don't know; Refuse to answer."*

[2] The premature death of Richard Brumberg in 1954 meant the original paper was never published.

2. *"Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in your account?"*
   More than today; Exactly the same; Less than today; Don't know; Refuse to answer
3. *"Do you think that the following statement is true or false? "Buying a single company stock usually provides a safer return than a stock mutual fund."*
   True; False; Don't know; Refuse to answer."

Lusardi and Mitchell referred to the first question as focussing on "Compound Interest", the second on "Inflation", and the third on "Stock Risk". Questions 1 and 2 were intended to evaluate respondents' knowledge level around the economic principle of saving and assess basic financial numeracy. Question 3 concentrated on the knowledge and awareness of asset price volatility and the principle behind risk diversification, which the authors assert are critical competencies required to make informed investment decisions (Lusardi & Mitchell, 2005).

Lusardi and Mitchell expressed some dismay at the results of their financial knowledge questions. In 2004, only just over a third of the survey respondents answered all three questions correctly, a further third provided two correct responses, and sixteen per cent answered just one question correctly. Ten per cent of the respondents did not answer a single question correctly. The findings of the HRS, a national survey of Americans over the age of 50, therefore mirrored the results of the Jump$tart Coalition surveys targeting high school students, thus demonstrating that both young and old Americans lacked financial knowledge.

Similar findings were made in England, where, targeting the over 50 age group, Banks and Oldfield (2007) surveyed English citizens as part of the 2002 wave of the English Longitudinal Study of Ageing (ELSA). It was found that a large proportion of their cohort had low numeracy levels and that numeracy was correlated with wealth and retirement savings and related to knowledge and understanding of pension arrangements.

The abovementioned work by Lusardi and Mitchell (2005) forms the bedrock of much of the research conducted on personal financial literacy, specifically financial knowledge, since its publication. The use of their three financial knowledge questions has become so widespread and globally adopted that in the field of financial literacy, they are referred to as the Big Three (Hastings, Madrian & Skimmyhorn, 2012). These questions have been used to measure individual financial literacy by Agnew, Bateman and Thorp (2013) in Australia, Boisclair, Lusardi and Michaud (2017) in Canada, Moure (2016) in Chile, Arrondel, Debbich and Savignac (2013) in France, Bucher-Koenen and Lusardi (2011) in Germany, Fornero and Monticone (2011) in Italy, Sekita (2011) in Japan, Alessie, Lusardi and van Rooij (2011) in the Netherlands, Beckmann (2013) in Romania, Klapper and Panos (2011) in Russia and Almenberg and Säve-Söderbergh (2011) in

Sweden. Along with select others, these studies form part of the Global Financial Literacy Excellence Centre[3] (GFLEC) Financial Literacy Around the World (FLat World) Project. Crossan, Feslier and Hurnard (2011), Grohmann (2018), and Kalmi and Ruuskanen (2018) have all made use of a slightly adapted version of the Big Three in examining financial literacy levels in New Zealand, Thailand, and Finland, respectively.

In 2005, van Rooij, Lusardi and Alessie used a modified version of the Big Three questions to create a basic financial knowledge five-question instrument (referred to as the "Big Five") for inclusion in the 2005 De Nederlandsche Bank (DNB) Household Survey. In addition to the Big Five, the survey included the formulation of a further ten knowledge questions. These were to test the knowledge of investment instruments, including stocks, bonds and mutual funds, and a more in-depth assessment of the conceptual understanding of risk diversification and the compromise between investment risk and return (Alessie, Lusardi and van Rooij, 2011).

The basic Big Five questions and the more sophisticated additional ten questions were implemented by Lusardi and Mitchell in the United States, using the Rand American Life Panel (ALP) survey of 2007. In contrast to the 2004 HRS respondent pool, which consisted of Americans over 50-years old, the new sample of adults over 18 years allowed these researchers to evaluate Americans' financial knowledge in their peak working and earning years. During this time, most individuals make critical financial decisions, such as buying a home or investing in a retirement fund (Lusardi and Mitchell, 2007).

In 2007/08, Lusardi, Mitchell and Curto (2010) added the Big Three to the National Longitudinal Study of Youth (NLSY) Wave 11 survey in the United States. In line with the findings of the Jump$tart Coalition survey of young Americans, levels of financial knowledge, as measured by the Big Three, were again found to be low.

The OECD/INFE undertook an alternative and more comprehensive approach to the Big Three (or Big Five) to measure personal financial literacy. They proposed a Core Competencies Framework on Financial Literacy for Adults. They developed four core financial competency areas to use as a structure upon which to formulate knowledge, behaviour and attitude questions (seven, nine and three question items, respectively). The four competency areas were: money and transactions, planning and managing finances, risk and reward, and financial landscape. Although many competencies could be beneficial in the financial decision-making process, the OECD/INFE

[3] GFLEC launched at the George Washington University School of Business in 2011, positions itself as a research centre for financial literacy research and policy (*FLAT World | Global Financial Literacy Excellence Center (GFLEC)*, n.d.).

considered these identified competency areas to primarily benefit an individual financial consumer (OECD, 2016).

Although the OECD/INFE Core Competencies Framework includes knowledge, behavioural and attitude dimensions, the OECD/INFE only set a minimum target for financial literacy within the test's financial knowledge dimension. The minimum score requires respondents to achieve correct answers to 70% of the seven knowledge questions. Within these seven knowledge questions is an identifiable overlap with the Big Three, as they included content on compound interest, inflation and diversification.

As indicated, despite comprising just three question items, the Big Three has become a foundational component to test the financial knowledge dimension within personal financial literacy test instruments. However, as they do not represent critical financial competencies from a business perspective, they are not included in the survey instrument developed in this study. Section 2.3.4 discusses further concerns regarding the prevalence of the Big Three.

Regardless of the conceptual model adopted, however, financial knowledge questions are rarely the only questions included in financial literacy instruments, which in most cases also contain measures of financial behaviour.

2.3.2 Financial Behaviour Measurement Instruments

While individuals can have high financial knowledge levels, their financial well-being will be determined by their actions and behaviour (OECD, 2016a). The OECD/INFE, among others, believes an assessment of financial behaviour is necessary to determine financial literacy levels. There is an important distinction in financial literacy work between incorporating financial behaviour (and attitude) into the definition of financial literacy or measuring financial literacy as a knowledge component and analysing those knowledge scores against reported behaviours to find a relationship. Emmons (2005) agrees that examining financial behaviours may reveal more about financial literacy levels, as high financial knowledge levels do not necessarily mean that individuals will make sensible financial decisions.

The Washington State Department of Financial Institutions survey introduced in Section 2.2.1 did not explicitly define financial literacy but stated that it should not be from measures of knowledge, experiences, or behaviours in isolation. The report suggested that to generate a more comprehensive indicator of an individual's financial literacy, the individual factors (dimensions) required aggregation, and there would need to be an understanding of the relational interaction between the factors (dimensions), in other words, a multidimensional conceptualization of financial literacy. The survey was one of the first to test financial behaviour explicitly and assessed whether negative financial behaviours were more prevalent in their "victim" group that

had succumbed to predatory lending than in their control group. When provided with a financial behaviour statement, both positive and negative behaviours, respondents could choose how frequently they engaged in the behaviour (always/often/sometimes). Interestingly, "never" was not provided as an option for respondents to select.

In addition to the Big Three knowledge questions included in the HRS survey module on planning and financial literacy, there were three questions that Lusardi and Mitchell (2005) termed retirement planning calculation:

1. *"Have you ever tried to figure out how much your household would need to save for retirement?"*
2. *"Did you develop a plan for retirement saving?"*
3. *"How often were you able to stick to this plan: Would you say always, mostly, rarely, or never?"*

Additionally, four questions on "planning tools" were asked:

1. *"Tell me about the ways you tried to figure out how much your household would need."*
2. *"Did you talk to family and relatives; co-workers or friends; Did you use calculators or worksheets that are computer or internet-based; Did you consult a financial planner or advisor or accountant?"*
3. *"How often do you keep track of your actual spending: would you say always, mostly, rarely, or never?"*
4. *"How often do you set budget targets for your spending: would you say always, mostly, rarely, or never?"*

These behavioural questions from Lusardi and Mitchell (2005), unlike the DFI survey, included "never" as response options. However, these behavioural responses were used to examine the relationship between financial knowledge and financial behaviour rather than being incorporated into a composite financial literacy score. Financial literacy in this study is essentially a uni-dimensional measure of knowledge that drives retirement planning behaviours.

In 2008, the year that was supposed to be the final year for the survey dissemination, the Jump$tart Coalition extended their survey group to include college students in addition to high school students. They devised a survey instrument which, together with knowledge items, also included questions on financial behaviour, including "credit card use, checking account balancing habits and incidence of insufficient funds and tax preparation" (Mandell, 2008). Similarly to the approach taken by Lusardi and Mitchell (2005), these behaviours were assessed relative to the knowledge scores rather than being incorporated into a composite financial literacy score.

A converse approach to using behaviour questions to segment and understand the knowledge scores was taken by the OECD/INFE International Survey of Adult Financial Literacy Competencies. They asked respondents about budgeting, active saving, making considered purchases and paying bills on time, keeping watch of financial affairs, striving to achieve long-term goals, and avoiding borrowing to make ends meet. A score of six or more "correct" financial behaviours indicated financial literacy in the financial behaviour dimension, the financial behaviour dimension being a component of overall financial literacy, a multidimensional construct.

Behavioural questions typically allow respondents to select from a scale that best defines the frequency with which they undertake a particular behaviour. Within the framework set out by the OECD/INFE, a few keywords form part of assessing financial behaviour. Specifically, use was made of the words "assesses", "checks", "seeks", "compares", "considers", "calculates", "queries", "tracks", "monitors", and "undertakes" in framing financial behaviours in each content area. All of these behaviours suggest that the respondent needs to be proactive in engaging with the financial world. To be considered as having good financial behaviour, respondents needed to actively participate in all financial transactions on a consistent and regular basis.

The respondents' financial attitude is likely to shape how readily they commit and adhere to good financial behaviours. A degree of confidence is required, particularly when individuals need to "query and monitor" financial service providers. Equally, self-discipline would seem to be a necessary trait. In a world where time is precious, "checking, considering, calculating" may require individuals to forgo other activities to devote the necessary time to these tasks. Hence, trying to tease out the respondents' financial attitude appears necessary to understand their behaviours better.

2.3.3 Financial Attitude Measurement Instruments

Following the multidimensional conceptual financial literacy model, an attitude dimension requires measurement, as it forms a component of overall financial literacy. The OECD/INFE incorporates attitude questions into their determination of financial literacy levels. In contrast, other researchers, such as Mandell and Klein (2007), Hayhoe et al. (2005), and Lusardi and Mitchell (2007), assess the relationship between attitude items and knowledge scores, similarly to the analysis of the relationship between knowledge scores and behaviours.

Attitude is a broad, multifaceted concept. In most financial literacy survey instruments, there are attempts to capture attitude as a measure of confidence with financial topics, or a degree of delayed gratification, or adherence to a longer-term financial plan that requires an attitude of self-discipline.

The OECD/INFE International Survey of Adult Financial Literacy Competencies included the following descriptive words within their three attitude questions: “motivated”, “confident”, “comfortable”, and “values”, clearly testing how comfortable an individual was with financial activities. There was also a distinction between short-term and long-term preferences within the OECD/INFE survey’s financial attitudes section. Respondents who “live for today” exhibit short-term preferences, while long-term preferences show an awareness of planning for the future (OECD, 2016a).

Mandell and Klein (2007)sought to understand whether an attitude of motivation to learn about and retain financial knowledge was an explanatory factor for US high-school students’ financial literacy scores. These researchers framed a motivated attitude or belief in the ability to have financial control as the antithesis of apathy and found the concept of motivation to be a driver of financial literacy scores. Thus, students who were engaged in the active retention of financial knowledge and who believed that they could control their future finances displayed higher levels of financial literacy, as measured by financial knowledge.

Attitude questions were implemented more extensively by Hayhoe et al. (2005) to evaluate the impact of credit card usage amongst American college students. Included in their survey were Likert-style questions about credit attitude and money attitude. It was found that students with higher cognitive credit scores (a better understanding of how credit cards work) were less likely to have credit cards, while students with high credit affective scores (an affinity for using credit cards) have more credit cards. Although the results from the money attitude survey questions were not found to be significant, it was found that the student sample was less likely to have more than four credit cards if they had received some personal finance education. The lower level of credit cards amongst more educated respondents suggested that knowledge shaped attitude and behaviour, at least among this survey cohort. An interesting aspect of this study is that less than four credit cards, which seems an irresponsibly high level of access to credit amongst students who are unlikely to have meaningful income, were deemed “acceptable” and indicative of more educated respondents.

In another study that included numerous attitude-related question items, Strömbäck et al. (2017) included elements of the Brief Self-Control Scale formulated by Tangney, Baumeister and Boone (2004) and the Short-Term Future Orientation Scale from work by Antonides, Groot and Raaij (2011) in a survey of Swedish adults. Also included were measurements of optimism and deliberativeness and measures of financial anxiety adapted from Fünfgeld and Wang (2009). Specifically, short-term preference in a financial attitude sense displays an unwillingness to plan and adhere to the plan for future wellbeing, and thus the Short-Term Future Orientation Scale measures a respondent’s preference for short-term benefits over and above longer-term goals.

Strömbäck et al. (2017) found that respondents with higher levels of self-control (those able to resist temptation, think through alternatives before acting, and take ownership of their financial future) displayed better financial behaviours and lower levels of anxiety about their current and future financial situation.

In the Rand American Life Panel (ALP) dataset in 2007, Lusardi and Mitchell introduced a self-assessed measure[4] of economic knowledge, as follows:

> *"On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your understanding of economics?"*

Many survey instruments have subsequently included a measure of self-assessment. Agnew and Szykman (2008), Hung, Parker and Yoong (2009), Hung et al. (2009), Fonseca et al. (2012), Bucher-Koenen et al. (2014), Finke, Howe and Huston (2016), Allgood and Walstad (2016) and Stolper and Walter (2017), amongst others, have all included a perceived knowledge component in their work.

An interesting approach was taken by Anderson and Robinson (2018), who included the Big Five questions in their survey of working-age Swedes and asked survey participants to assess the likelihood that they had answered these five questions correctly. This self-assessment question was termed the perceived score, and the difference between the actual and respondent estimation of correct answers to the Big Five questions was labelled as the overestimation score. The overestimation was higher for men than for women and increased with the respondents' age. On the other hand, respondents with higher levels of education had lower levels of overestimation. The following Likert-scale attitude question was also included in the survey instrument.

> *"Do you agree or disagree with the following statement? "I think personal financial matters are boring." Please select one.*
>
> *Agree, Agree somewhat, Disagree, Strongly disagree, Don't know, Prefer not to say"*

Using a probit regression model, the authors found that interest in finance was strongly related to financial literacy scores as measured by the Big Five knowledge questions, suggesting an interdependence between financial knowledge and financial attitude. A positive and inquiring attitude towards finance may lead the individual to actively seeking more knowledge, and in turn, being knowledgeable may make the individual feel more positive about finance-related topics.

At its core, perceived knowledge or self-assessed knowledge indicates the respondents' self-confidence in their financial abilities. Tang and Baker (2016) proposed that self-esteem, the

[4] A self-assessment rating is a measure of self-belief or self-confidence and a measure of the respondent's attitude towards financial knowledge.

respondent's self-perception, drives financial behaviours, conditional on objective and subjective or perceived financial knowledge. This non-cognitive, psychological measure of self-confidence, self-esteem or attitude is a novel inclusion in the composite measure of financial literacy and associated financial behaviours. However, few authors have sought to include financial attitude as part of the composite financial literacy score. Instead, the attitude and behavioural insights are used as explanatory variables in understanding and interpreting financial knowledge scores. Adhering to the multidimensional conceptualisation of financial literacy outlined in Section 2.2.2.3, this study incorporated financial attitude and financial behaviour, together with financial knowledge, into a composite score of business financial literacy.

2.3.4 Comments on Existing Financial Literacy Measurement Instruments

In the testing of personal financial literacy, versions of the Big Three have been used extensively worldwide and, due to their ubiquity, have become a benchmark measure. In designing the questions for the 2004 HRS survey, Lusardi and Mitchell (2011b) adhered to four fundamental principles:

1. *Simplicity*
2. *Relevance*
3. *Brevity*
4. *Capacity to differentiate*

While the Big Three certainly follow these four principles, they do not meet the best practice questionnaire design specifications outlined by Kempson *et al.* (2011). Kim and Mueller (1978) proposed including between three and five items (questions) per content area, and this concept was incorporated by Huston (2010). Using the notion of the four personal financial literacy content areas proposed by Kempson *et al.* (2011) and three to five items per content area proposed by Kim and Mueller (1978) and Huston (2010), a personal financial literacy survey instrument would be expected to contain twelve to twenty questions. Twenty (or even twelve) questions are in sharp contrast to the three questions that make up the Big Three.

Two independent schools of survey instrument construction methodology appear to have developed. There would appear to be a *brevity approach* centred around the Big Three and slightly extended Big Five, and a *comprehensive approach* represented by the Jump$tart Coalition, the UK/FSA financial capability study, and the Washington State DFI survey. The OECD/INFE methodology framework now leads the comprehensive approach. It underpins both the PISA youth survey and the Adult Financial Literacy Competencies survey in the personal financial literacy context and the OECD/INFE Core Competencies Framework on Financial Literacy for SMMEs within the business financial literacy context. Unsurprisingly, the OECD frameworks

(personal and business) use much of the methodological work that went into the UK/FSA financial capability study.

Those in favour of the brevity approach support a truncated financial literacy question set for several reasons. International comparability is the most often cited benefit (Lusardi & Mitchell, 2011). As the question material is not country-specific, the survey's administration to respondents in different countries is achievable. For example, questions about taxes, insurance products or pensions are typically unique to a country or region, whereas inflation, interest rates and investment diversification are globally applicable.

Lusardi and Mitchell (2011b) also highlighted that the Big Three are often included in more extensive socioeconomic questionnaires rather than used as a stand-alone survey instrument. They believe it is best practice to embed financial literacy surveys within national surveys to better extract potential causal data. A composite survey allows for the use of demographic data to control for measurement error or reverse causality or to uncover a relationship between variables.

The inclusion of financial literacy questions in national socioeconomic surveys means the financial literacy component is likely to be constrained not to make the survey unwieldy or lengthy to the extent respondents tire and opt-out of a thorough completion. While a national survey allows for the capture of a wealth of demographic and other potentially relevant data, perhaps it is at the price of excluding financial literacy-related questions that may meaningfully add to the financial literacy construct. Like the comprehensive approach adopted by the OECD/INFE, more specific and granular financial literacy tests potentially carry sufficient advantages to justify their construction and dissemination costs.

These advantages are particularly true when considering the importance of testing not only financial knowledge but also financial behaviour and financial attitude in addition to the typical demographic detail questions contained in a survey instrument. More comprehensive testing allows for a multidimensional determination of a financial literacy score rather than a reliance on the knowledge dimension to determine financial literacy.

While this study was mindful of the four proposed principles (simplicity, relevance, brevity, capacity to differentiate), the formulation of the business financial literacy instrument discussed in subsequent chapters followed a more comprehensive approach in its formulation, aligned with the OECD methodology. It also starts with a framework outlining the content areas and competencies (Section 3.4), emphasising knowledge, behaviour, and attitude items.

When conducting financial literacy surveys, a further challenge is developing a suitable method for calculating an overall financial literacy score for each respondent based on their responses. The following section addresses financial literacy instrument scoring methodologies.

2.4 Financial Literacy Scoring Methodologies

There are two approaches to the scoring methodology that have been applied to financial literacy test instruments. Specifically, scoring occurs using either the computationally simple, percentage correct method, or more computationally sophisticated and data-intensive methodologies are applied; typically factor analysis, including principal component analysis (PCA), or the use of item response theory (IRT).

Irrespective of the survey methodology used, an evaluation of test instruments conducted by Huston (2010) found that 88% of the studies reviewed (71 studies) did not provide any guidance for interpreting the financial literacy scores generated by the study. Additionally, nearly 90% of the studies did not provide the test respondent with a measure of their financial literacy levels.

The sections below discuss those instruments that have applied a percentage correct scoring methodology, followed by those that used a more sophisticated determination of a financial literacy score.

2.4.1 Number Correct Score

Financial literacy is often represented by how many items the respondent answers correctly, usually expressed for descriptive reporting as a percentage correct financial literacy score. In some research, the number of correct answers forms the basis of index construction to analyse and understand the variance between respondents. Application of this scoring methodology to knowledge questions would seem sensible. An item answer is either correct or incorrect. However, there is no rigorous mechanism to determine how many correct answers deems a respondent financially literate, and as a result, different authors have applied different cut-off levels to this determination.

For example, Chen, Volpe and Pavlicko (1996) and Chen and Volpe (1998), who used the percentage of correct answers as financial literacy scores, considered a score of 70% as their threshold for considering a respondent financially literate. In their 1998 study, the overall mean percentage of correct scores was 52.87%, which they assessed to indicate a low financial knowledge level.

The Jump$tart Coalition surveys also computed scores on a correct percentage basis but added a grading to the score. Using the standard American school grading system, a “C” grade was indicated as 75% or better, while a failing grade was less than 60% (Mandell, 2008).

The use of the Big Three or the extended Big Five relies heavily on the computation of the percentage of the survey sample that answers each question correctly, or the combination of correct answers, to compute a financial literacy score. Bumcrot, Lin and Lusardi (2013) adopted the formulation of the correct responses into an index to review the 2009 National Financial Capability Study results using the Big Five questions.

In a broad global study of financial literacy, an adapted version of the Big Three included an additional numeracy question administered by the Standard & Poor's Rating Service to 150,000 adults in more than 140 countries during 2014. They defined a person as financially literate when three out of the four question answers were correct (75%). Assessing financial literacy on this measure meant that only 33% of the world's adults are considered financially literate (Klapper, Lusardi & van Oudheusden, 2014).

The global survey instrument developed by the OECD/INFE counts the number of correct responses to the knowledge *and* financial behaviour questions. A score above three on financial behaviours, which indicated a longer-term preference, was considered a high score (Atkinson & Messy, 2011). Regarding the test's financial knowledge dimension, a minimum financial literacy target was for respondents to achieve correct answers to 70% of the questions (OECD, 2016a).

Thus, there is a range of levels to mark the threshold between financial literacy and financial illiteracy in the personal financial literacy context: 60% (Jump$tart), 70% (OECD/INFE) and 75% (S&P rating service).

Kempson et al. (2011) suggested that simple arithmetic sores were appropriate for knowledge questions with a definite correct/incorrect answer. However, these authors proposed that survey instruments that included financial behaviour and financial attitude should not be scored simplistically.

Computing the percentage of correct answers also runs the risk of not differentiating between easy knowledge questions and more advanced knowledge questions, and the PISA Financial Literacy survey, therefore, calibrated its 40 questions based on each question's difficulty (OECD, 2017).

However, despite the potential shortcomings of a number correct scoring methodology, including the inability to differentiate between difficult and easy question items and no standard threshold to deem a respondent financially literate, this computationally simplistic approach has two distinct benefits over more comprehensive methods. Firstly, the score of one respondent can be computed entirely independently of other respondents, whereas comprehensive scoring methods rely on a large respondent data sample before scores can be computed. Moreover, because of their computational simplicity, percentage scoring processes can be automated.

Computational simplicity is particularly useful when the instrument is electronically distributed, as it enables the respondent to be presented with their financial literacy score immediately after instrument submission.

2.4.2 Comprehensive Scoring Methods

More comprehensive scoring methodologies were selected by, amongst others, the FSA commissioned UK study, which argued that a scale or score across the questionnaire could not be determined and that a "pass mark" would not be appropriate. Instead, five broad criteria were adopted to select a scoring system: reliability, validity, relevance, comprehensibility, and longitudinality.

Using the five FSA criteria, three potential scoring systems were identified. Thus, (i) scoring could be through a simple count to determine a percentage score, (ii) using regression analysis, a predictive model could be formulated, or (iii) borrowing the methodology used for the Index of Multiple Deprivation and Health indices, more complex factor analysis could be performed (Kempson, Collard & Moore, 2005).

Several authors have adopted factor analysis, including PCA methodologies and IRT techniques, to determine a more sophisticated scoring output.

2.4.2.1 Factor Analysis Methodologies

Factor analysis is a measurement of a latent (unobservable) variable based on the combination of underlying variables or item responses. A factor analysis applies an optimal weight to the measured variables (question responses), which allows for evaluating the latent variable, which is the level of financial literacy in this study.

Building on the financial capability research conducted on behalf of the FSA, Atkinson et al. (2007) undertook a factor analysis to create a score for each financial capability key area or content topic, using the survey responses from 5,328 British nationals, including a sample of ethnic minorities. This distribution of the scores rather than a specific score level per content topic allowed the authors to assess in which content topics the respondent group required assistance.

For the 2007 Rand ALP survey, which included the questions designed for the 2005 DNB Household Survey, instead of using the percentage correct response approach, Lusardi and Mitchell (2007) determined the respondents' financial literacy score by undertaking a PCA factor analysis. The thirteen question items were loaded onto one factor, and the computed factor loadings formed the weight for each item to determine a weighted financial literacy score of knowledge questions.

To investigate South African adults' financial literacy, Leibbrandt and Nanziri (2018) also used the PCA factor analysis methodology to construct a financial literacy index, but in this case, determined factor weights against two dimensions or factors rather than one. Specifically, their composite financial literacy computation model used a two-dimensional conceptualisation (financial knowledge and financial capability) of financial literacy as follows:

$$FLX_i = \sum \left[F_j(Q_{ij} - Q_j^-\right]S_j \; for \; i = 1, \dots, N \; and \; j = 1,2 \qquad \textbf{(2-1)}$$

Where the eigenvector, F_j is the first principal component weight, Q_{ij} provides the score in domain j for individual i, Q_j^- is the sample mean, and S_j is the sample variance resulting in a financial literacy score, FLX_i.

Potrich, Vieira and Kirch (2018) computed a financial literacy indicator using the factor loadings to create a weighted average score for each dimension (attitude, behaviour, knowledge) and then combined the weighted average of each dimension for a composite score.

Behrman et al. (2012) applied the method developed by Brockett et al. (2002), referred to as PRIDIT (a principal component analysis of RIDIT[5] scores), to measure financial literacy. This approach consisted of two steps to determine the application of weights to each question to generate a composite financial literacy score. In the first step, a higher penalty was applied if the respondent answered a question incorrectly in instances where most of the broader sample group answered correctly, and *vice versa* (respondents were credited if they correctly answered questions that most other respondents answered incorrectly). The second step consisted of applying PCA to compute each question's weights for inclusion within the score. The authors suggested that the final PRIDIT weights indicated how useful a question was relative to other questions regarding the underlying latent financial literacy variable.

The two-step PRIDIT methodology was also used by Lusardi, Mitchell and Curto (2014) to determine an overall financial literacy score, combining items from the HRS Survey to construct an overall index. Interestingly, despite the computation complexity of the PRIDIT methodology, in this study, a high degree of correlation was observed between the PRIDIT weighted index and a simple index that was computed as the sum of the correct item answers. However, the authors suggested that the analysis of the PRIDIT methodology's output provided additional insights over

[5] The term RIDITS was chosen to be analogous with PROBITS and LOGITS, the first three letters stand for Relative to an Identified Distribution. Thus, RIDITS are relative to empirical rather than theoretical distributions Brockett *et al.* (2002)

and above the simple index, specifically, as also argued by Behrman et al. (2012), which question items were more "informative".

2.4.2.2 Item Response Theory Methodologies

PRIDIT methodology is not the only approach that allows researchers to differentiate between survey items by creating difficulty weights. A further statistical technique to differentiate between items and analyse a latent variable is Item Response Theory (IRT).

At a fundamental level, this is the core difference between summing together the proportion of correct responses and the ability to differentiate between the individual item difficulty levels. IRT does not assume that items are equivalent, in contrast to the assumption under Classical Test Theory (CTT). IRT allows for the ability to quantify error within each item response using the item's level of difficulty, the capacity of the item to discriminate between responses (the degree to which the item can be unambiguously classified), and the likelihood of false positives where the respondent guesses, rather than knows, the answer (Aday & Cornelius, 2006).

IRT models allow researchers to use the collected responses, or empirical data, to determine which items to incorporate into the overall financial literacy scale or score (Knoll & Houts, 2012). Commonly used IRT logistic models estimate the probability of a respondent selecting a correct answer conditional on the respondent's ability level and as a function of both the item's difficulty and the item's ability to discriminate between respondents with high versus low levels of financial literacy. The inclusion of item difficulty and item discrimination is a two-parameter logistic model (2PL).

Using IRT, both Hung et al. (2009) and Fonseca et al. (2012) incorporated the responses to financial knowledge questions, together with self-assessed responses of financial skill and knowledge, to construct a financial literacy index. Hung et al. (2009) formulated both a unidimensional model of financial literacy (financial literacy is just one construct) and a multidimensional model of different financial literacy subdomains (basic financial knowledge, investment knowledge and pensions knowledge) to measure objective financial literacy.

Arguably, the subdomains in the multidimensional model are not "dimensions" as discussed in Section 2.2.2 but rather content items of the financial knowledge dimension. The same argument can be made for the factor analysis scores generated by Atkinson et al. (2007), who did not find a score per domain but rather by content area.

For both the uni- and multidimensional model formulations, Hung et al. (2009) assumed the probability of correctly answering an item was conditional on the respondent's objective financial literacy level. These authors presented the following multinomial logit equation:

$$P_{ij}(FL) = \frac{\exp\left(\beta_{ij}FL + \alpha_{ij}\right)}{\sum_k \exp\left(\beta_{ik}FL + \alpha_{ik}\right)} \quad \textbf{(2-2)}$$

The probability of selecting answer category *j* for item *i* with the highest value of β_{ij} approaches 1 as financial literacy (FL) increases. Those items that are good at measuring the unobserved trait of financial literacy or a financial literacy subdomain have high β_{ij} values. Equation 2-2 follows the standard formulation of a standard two-parameter IRT model (2PL), where the latent trait (typically denoted as theta) is the level of financial literacy.

Vieira, Potrich and Bressan (2020) used an IRT approach to identify which items of a twenty-four item instrument to retain to produce an assessment instrument with a smaller number of items while still retaining sufficient items to test different levels (basic, intermediate, advanced) of financial knowledge.

When an IRT model is applied, there is a requirement to use empirical survey data to find estimates of the item difficulty (1PL model) or the item difficulty and discrimination (2PL model). For example, in the data analysis manual of the OECD Programme for International Student Assessment (PISA), it is indicated that most items in its surveys are scaled using an IRT scaling methodology, making use of a Rasch one-parameter (1PL) model (OECD, 2009a). In PISA's case, the calibration data included responses from 15,000 students, and only after the estimation of the international parameter could individual students' scores be computed. Determining scores (the latent trait) is a computationally complex step that requires specialist software.

2.4.3 Commentary on Financial Literacy Scoring Methodologies

An additional factor in the computational complexity of more comprehensive scoring methodologies like factor analysis, including PRIDIT or IRT, is the introduction of a time lag in the ability to report the score to the respondent. Huston (2010) found that most studies (88% and 90% respectively) did not give guidance on the interpretation of financial literacy scores or did not provide the respondents with their scores. The lack of providing the respondent's score is understandable, particularly when empirical data from a large sample must first be gathered before the computational scoring work is possible. The use of either factor analysis or an IRT scoring approach makes it impossible to compute a score without empirical data, and as such, the score is a function of the empirical data.

Under such circumstances, especially when applied to knowledge questions, merely summing the correct item responses and computing a score is efficient. Such a methodology allows the researcher to immediately inform the respondent of their strengths and weaknesses within the financial knowledge dimension. While behavioural and attitude questions typically allow for

scaled rather than dichotomous responses, a relatively straightforward computation of the score is possible by converting a scaled behavioural or attitude response to some numerical measure. The numerical behaviour and attitude scores then allow for the scores from all dimensions (knowledge, behaviour and attitude) to be instantaneously computed and reported.

While multiple authors have attempted to find more sophisticated methodologies for the computation of a financial literacy score over and above a computationally simple percentage correct methodology, it would appear that no one robust computational methodology that adds meaningful value over a simple approach has emerged.

Using empirical data to determine a financial literacy score is also problematic when the respondent groups are small or have very different characteristics. If respondent groups are diverse in their characteristics, using a random selection approach to determine factor weights or IRT model inputs requires a large data sample. With a smaller sample, the empirical data which shapes either the factor weights or the IRT parameters are highly dependent on the characteristics of the survey response group. A response group with a different profile is likely to produce different factor analysis results or a different indication of item difficulty or discrimination, and therefore a different composite financial literacy score.

Irrespective of the scoring methodology applied, some relationships between general demographic characteristics and personal financial literacy are observed across multiple instruments administered globally. The following section discusses some of these demographic findings.

2.5 Findings on Demographic Relationships with Financial Literacy

Many studies decomposed financial literacy results by demographic factors. Some studies present this demographic decomposition descriptively, reporting survey findings by subgroup, while others attempt some form of exploratory data analysis (EDA) to investigate which demographic factors contribute to the discrepancies observed in financial literacy levels. For example, Chen and Volpe (1998) conducted a form of EDA using independent variables like academic discipline, class rank (under-graduate versus graduate), gender, race, nationality, work experience, age and income. The resulting logit regression model indicated that educational background, class rank and gender were statistically significant explanatory factors of level of financial literacy within the formulated model.

Although authors have used other cohort-relevant factors, the most used demographic factors include gender, age, race, income level, and educational attainment. In this regard, Banks and Oldfield (2007) analysed the relationship between cognitive ability (focussed on numeracy)

against wealth accumulation and pension arrangements in the 2002 wave of the English Longitudinal Study of Ageing (ELSA) of English citizens aged 50 years and over. A clear correlation was found between numeracy and wealth, as well as between educational attainment and wealth. An individual with high levels of numeracy and education would typically accrue significantly more wealth by retirement age.

A significant focus of the Big Three item set implemented across various countries (see Section 2.3.1) has been to use the financial literacy results and demographic factors to understand the retirement planning behaviour exhibited (or not) by segments of the respondent group. In the 2004 Health and Retirement Study (HRS), Lusardi and Mitchell (2005) decomposed the financial knowledge results by gender, race, age, marital status, place of birth and education. However, in cases where the Big Three have been implemented, the demographic factors are used descriptively to segment the financial knowledge scores to find a relationship between demographic subgroups and reported financial behaviours. As a mechanism of presenting the demographic characteristics observed across a selection of financial literacy surveys, the summary table in Section 2.5.1 below indicates whether discrepancies were observable by gender, income level, race, and educational attainment. Also indicated is whether the authors presented the data as descriptive findings by subgroup or whether, additionally, they undertook some form of EDA to link demographic factors to financial literacy levels. In instances where the authors undertook EDA, the statistically significant demographic indicators carry an asterisks symbol.

There are instances where multiple authors have assessed the same datasets; in other words, undertaken analysis on the same survey results. Rather than presenting a duplication of findings within the tabular summary, the summary displays the results of the first chronological analysis of each respondent dataset.

A demographic factor that may seem missing from the tabular demographic factor presentation is respondent age. Section 2.5.2.5 discusses the findings of various financial literacy survey instruments by the age of the respondent group.

2.5.1 Summary of Key Demographic Characteristics

The table below presents a summary of the principal demographic findings from a variety of financial literacy surveys. Some research findings run counter to results found by other authors. These contrarian findings are highlighted in grey and discussed in Section 2.5.2.

Table 2-3: Tabular Summary of Demographic Findings

Authors	Publication Year	Geographic Focus	Survey Group	Gender Discrepancy Observed	Income Level Discrepancy Observed	Race/Ethnic Group Discrepancy Observed	Educational Attainment Discrepancy Observed	Descriptive/ Explanatory[6]
Chen, Volpe	1998	United States	College Students	y*	y*	y*	y*	Explanatory
Moore	2003	United States	Adults (Washington State)	n/a	y	y	y	Descriptive
Lusardi, Mitchell	2005	United States	50+ aged adults	y	y	y	y	Descriptive**[7]
Banks, Oldfield	2007	England	50+ aged adults	y	n/a	n/a	y	Descriptive
Mandell	2008	United States	High school students	n	n/a	y	n/a	Descriptive
Mandell	2008	United States	College students	y	n/a	y	n/a	Descriptive
Lusardi, Mitchell, Curto	2010	United States	Youth	y*	n/a	y*	y*	Explanatory
Dvorak, Hanley	2010	United States	Adults	y*	y*	n/a	y*	Explanatory
Lusardi, Mitchell	2010	United States	Adults	y	y	y	y	Descriptive**
Lusardi, Mitchell	2011	United States	Adults	y	n/a	y	y	Descriptive**
Fornero, Monticone	2011	Italy	Adults	y	n/a	n/a	y	Descriptive
Sekita	2011	Japan	Adults	y	y	n/a	y	Descriptive**
Alessie, Lusardi, van Rooij	2011	Netherlands	Adults	y	y	n/a	y	Descriptive**

[6] Some studies present this demographic decomposition descriptively, reporting survey findings by subgroup, while other studies attempt some form of exploratory data analysis (EDA) to investigate which demographic factors contribute to the discrepancies observed in financial literacy levels.

[7] * indicates a statistically significant variable in planning behaviour; ** indicates the authors assessed retirement planning behaviour by demographic factor; grey shading indicates a result contrary to other studies.

Authors	Publication Year	Geographic Focus	Survey Group	Gender Discrepancy Observed	Income Level Discrepancy Observed	Race/Ethnic Group Discrepancy Observed	Educational Attainment Discrepancy Observed	Descriptive/ Explanatory[6]
Bucher-Koenen, Lusardi	2011	Germany	Adults	y	n/a	n/a	y	Descriptive**
Klapper, Panos	2011	Russia	Adults	y	y	n/a	y	Descriptive**
Crossan, Feslier, Hurnard	2011	New Zealand	Adults	y	y	y	y	Descriptive**
Almenberg, Säve-Söderbergh	2011	Sweden	Adults	y	y	n/a	y	Descriptive**
Atkinson, Messy	2012	Global	Adults	y	y	n/a	y	Descriptive
Agnew, Bateman, Thorp	2013	Australia	Adults	y	y	n/a	y	Descriptive**
Arrondel, Debbich, Savignac	2013	France	Adults	y	y	n/a	y	Descriptive**
Beckman	2013	Romania	Adults	y	y	y	y	Descriptive**
Moure	2016	Chile	Adults	y	y	n/a	y	Descriptive**
Boisclair, Lusardi, Michaud	2017	Canada	Adults	y	y	n/a	y	Descriptive**
Grohmann	2018	Thailand	Adults (Bangkok)	n	y	n/a	y	Descriptive
Leibbrandt, Nanziri	2018	South Africa	Adults	y	y	y	y	Descriptive
Kalmi, Ruuskanen	2018	Finland	Adults	y	y	n/a	y	Descriptive**
Potrich, Vieira, Kirch	2018	Brazil	Adults	y	y	n/a	y	Descriptive
Rieger	2020	Germany	Adults	y	y	n/a	y	Descriptive

2.5.2 Discussion of Demographic Characteristics

2.5.2.1 Gender and Financial Literacy

Most researchers found a disparity in financial literacy levels based on gender, irrespective of the geographic location of the survey or age of the respondent group, with women tending to display lower financial literacy levels than men.

For instance, Atkinson and Messy (2012) undertook a multivariate analysis of the OECD/INFE Pilot Study results, which was administered in fourteen countries. It was found that men scored significantly higher than women in nine countries, and in none of the countries were the financial literacy scores of women significantly higher than those of men. Even when controlling for other socioeconomic factors, in eight countries, gender remained a significant explanatory variable.

Interestingly, of the fourteen countries examined, it is South Africa (where this dissertation bases its exploratory study) where other socioeconomic factors outweighed the significance of gender in explaining differences in financial literacy scores. Thus, in South Africa, low-income levels and incomplete schooling had a negative association with financial literacy, resulting in respondents in the low-income bracket and those who had not completed school showing low levels of financial literacy irrespective of gender.

In a finding conceptually related to the above South African results, Fornero and Monticone (2011) suggested that gender disparities are related to other socioeconomic factors such as employment. Thus, in their Italian study, a lower level of gender disparity was found in the sub-sample of employed (salaried and self-employed) men and women relative to the full sample, which included unemployed respondents.

Mandell (2008) noted that in the 2008 administration of the Jump$tart Coalition survey, male high school students slightly outperformed female high school students. However, in the 1997 and 2002 surveys, this result was reversed. He concluded that at a high school level, there are no persistent gender-based differences in financial literacy. The evaluation of the College Age survey returned an alternative conclusion. A gender discrepancy was observed among college students, but counter to many studies' findings, females outperformed males. It is not clear how female high school students moved from being mainly on par with their male high school counterparts to outperformance in college. This finding was also counter to numerous Big Three/Big Five centred studies conducted in the United States in which American women underperform American men. Perhaps the more comprehensive nature of the Jump$tart survey instrument, 31 knowledge-based questions rather than three or five knowledge-based questions, uncovered a different dimension to financial literacy that is not gender-based. This discrepancy in findings appears to warrant further investigation.

In Germany, an analysis of survey data by Bucher-Koenen and Lusardi (2011) revealed another unusual finding on gender-related differences in financial literacy. In this case, the differences in financial literacy between male and female respondents from the old West Germany were compared to those between male and female respondents from the old East Germany. In the old West Germany, a significant financial literacy difference existed, with men outperforming women. However, in the previously East German region, no gender difference was revealed. As a group, West Germans returned significantly more correct answers than their East German counterparts reflecting persistent differences between eastern and western Germany. A potential reason proposed to explain the lower gender disparity in the old East Germany is that women's labour market attachment[8] in the east was higher than in the west.

Fonseca et al. (2012) proposed that the process of financial specialisation within households may cause gender disparities in financial literacy. Thus, these researchers suggest that men make more financial decisions within a household, which allow them to increase their financial knowledge relative to women. Using a Blinder-Oaxaca decomposition methodology, these authors sought to understand the determinants of the gender disparity using data collected by the Rand ALP Survey. However, their analysis failed to confirm or support their proposition, instead finding that the spouses' relative educational attainment led to the more highly educated spouse taking on more financial decision-making.

In contrast, Grohmann et al. (2016) sought to understand why Thai middle-class women did not display lower levels of financial literacy than men, as found in other, predominantly Western studies. They proposed three possible explanations for their finding: firstly, that their study was of a different design; secondly, that their survey sample's composition was different; and thirdly, that their survey was conducted in a different country. Thus, the authors suggested that the lack of gender disparity was a country-specific finding and proposed that because Thai women have high numeracy levels, excellent education and high levels of financial responsibility within the family and in the corporate segment, they are better equipped to display high financial literacy levels.

Thus far, academic research has not uncovered a universal explanation for the gender disparity observed in financial literacy levels. Given the findings from Thailand, an Asian country, South Africa, a developing country and former communist, Eastern-bloc countries, there may be specific cultural or economic climate factors that studies administered predominantly in Western geographies have not uncovered.

[8] Labour market attachment encompasses various definitions, but refers to employed, self-employed or seeking employment individuals (Bell, D. 2012).

As outlined in Section 1.6, this study decomposes the financial literacy levels amongst the entrepreneurial group surveyed by gender to understand whether a gender difference is observable in this instance, as is widely found in personal financial literacy studies.

2.5.2.2 Income Level and Financial Literacy

Researchers have universally found an income level disparity in financial literacy scores. Thus, respondents with higher income levels achieve more correct answers or practise better financial behaviour than respondents with low-income levels. Related to income level discrepancies is labour market status, which researchers typically categorise as not employed, employed, self-employed and retired.

For example, Bucher-Koenen and Lusardi (2011) found that self-employed respondents in Germany were more likely to have planned for retirement and answered all three of the Big Three items correctly than the other labour market status groups. Likewise, Boisclair, Lusardi and Michaud (2017) in Canada, Arrondel, Debbich and Savignac (2013) in France, Fornero and Monticone (2011) in Italy, Alessie, Lusardi and van Rooij (2011) in the Netherlands, and Beckmann (2013) in Romania, found that self-employed individuals displayed higher levels of financial knowledge compared to the "employed for wage" group.

The above findings were not necessarily all statistically significant, however. Fornero and Monticone (2011), for example, specifically commented that their findings in this regard were not statistically significant. Similarly, Lusardi and Mitchell (2011a) also found that while the self-employed in the United States obtained the highest number of three correct answers, the differences between the self-employed and employed groups were not statistically significant.

Further, although Sekita (2011) found that the self-employed were more likely to have implemented a plan for retirement in Japan, they did not outperform working or formally employed respondents with regards to the percentage of correct answers to the Big Three survey. Similarly, in Finland, it was also found that the latter outperformed the self-employed (Kalmi & Ruuskanen, 2018).

In a South African context, the highest income earners achieved the highest financial literacy score, but those respondents who identified as self-employed were surpassed in financial literacy score by the formally employed (Leibbrandt & Nanziri, 2018). Within South Africa, as indicated in Section 1.3, the self-employed are not necessarily motivated similarly to self-employed respondents in more developed markets. This South African finding may reflect the variance in other explanatory demographic factors like educational attainment or income level rather than labour market status. It may also indicate a lack of human capital and adequate financial

competencies among entrepreneurs. This finding emphasises the importance of addressing entrepreneurs' financial literacy levels to offer appropriate support.

2.5.2.3 Race/Ethnic Group and Financial Literacy

Studies conducted in those countries with multi-racial populations or distinct ethnic groups tend to capture racial classification within the administered survey instrument's demographic detail section. White Caucasian respondents typically outperform Black African or ethnic minority respondents. Leibbrandt and Nanziri (2018) found that White South Africans obtained the highest financial literacy scores, followed by Indian/Asian South Africans and then Coloured and Black people.

Lusardi and Mitchell (2005) and Lusardi and Mitchell (2011a) found that White Americans outperformed Black and Hispanic Americans; similarly, at a high-school and college-age level, Mandell (2008) showed White American students scored more highly than African, Hispanic, Asian or Native-American students. Crossan, Feslier and Hurnard (2011) found that those of Māori ethnicity displayed lower levels of financial literacy than the general population of New Zealand, and Beckmann (2013) presented information that the ethnic minority Roma people underperformed Romanians or Hungarians in Romania.

Understanding the underlying reasons why certain racial groups tend to present higher financial literacy scores than others is a complex and sensitive task. While studies have reported the racial difference, investigating the underlying reasons seems to have been beyond financial literacy research scope thus far. However, this is likely a manifestation of other underlying factors, such as differences in educational or employment opportunities or socio-economic status. It would be necessary to better understand and interpret these results, particularly if the goal is to improve financial literacy levels across all individuals irrespective of their racial or ethnic group.

2.5.2.4 Level of Education and Financial Literacy

Apart from one anomalous finding by Beckmann (2013) in Romania, all personal financial literacy surveys find a consistent relationship between increased education and financial literacy levels. Surprisingly, Beckmann (2013) found that, although respondents with a post-graduate level of education achieved the highest financial literacy score, there was a discontinuity between college graduates (undergraduate degree) and high-school students. Thus, those with a high-school level of education outperformed respondents with a college degree either overall (in Romania), or in specific knowledge areas (in Croatia and the former Yugoslav Republic of Macedonia).

As business financial literacy is presented in Figure 1-1 as a higher-level context-specific layer, to be financially literate in a business environment relies on the foundational scholastic knowledge

and skills, the domain-specific financial literacy knowledge and skills and the context-specific personal financial literacy knowledge and skills. Thus, a great deal of education is potentially required to achieve an appropriate level of business financial literacy. Within the context of entrepreneurship, the level of education is a known factor in achieving business success.

Thus, in South Africa, Preisendörfer, Bezuidenhout and Bitz (2012) found that (although consisting of a small and very localised sample) those entrepreneurs with a higher level of schooling and some industry-specific experience in their entrepreneurial field tended to be more successful.

Similarly, Peters and Brijlal (2011) found that the level of education of South African SMME owners was related to business success. However, in contrast to the work conducted by Preisendörfer, Bezuidenhout and Bitz (2012), Peters and Brijlal (2011) focussed on businesses registered on the Small Enterprise Development Agency (SEDA) database. While these are small and medium businesses, registration implies that these are formal rather than informal businesses. Both studies supported the view that education and knowledge are critical to business survival and, ultimately, success. It is likely that this required knowledge to be successful in business in South Africa (and elsewhere) also includes high business financial literacy levels.

2.5.2.5 Respondent Age and Financial Literacy

A variety of previously administered financial literacy surveys found that both the young (high school students, college students, respondents under 30) and older respondents (above 50 years) tend to return low financial literacy levels.

Lusardi and Mitchell (2011a), in the United States National Financial Capability Study (NFCS), found that the level of financial literacy was lowest among those under 35 or over 65 years. This finding was in line with the HRS Survey, which found that retirement-age Americans displayed low financial literacy (Lusardi & Mitchell, 2005). At the other end of the age spectrum, Mandell (2008) found low levels of financial literacy amongst high school and college-age Americans over the various administrations of the Jump$tart Coalition survey, and an examination of the results of the 2007-2008 National Longitudinal Survey of Youth by Lusardi, Mitchell and Curto (2010) similarly showed American youth to have low levels of financial literacy.

These results were also echoed outside of the US. Thus Agnew, Bateman and Thorp (2013) found that Australian young adults under 35 years responded less accurately than older groups. In contrast, Fornero and Monticone (2011) found that the levels of financial literacy amongst more experienced working-age Italian adults between 36 and 50 years were higher than those of young adults and retirees. Sekita (2011) also found this inverted U-shaped pattern of financial literacy levels by age in Japan, as did Bucher-Koenen and Lusardi (2011) in Germany, Arrondel, Debbich

and Savignac (2013) in France, Kalmi and Ruuskanen (2018) in Finland, and Beckmann (20**13)** in Romania. However, in one exception, Alessie, Lusardi, and van Rooij (2011) found that in the Netherlands, the differences in financial literacy levels between different age groups was not significant.

While age may be an explanatory factor intra-group, it does not appear to be significant as an explanatory variable overall. Essentially, while the young and the old many have slightly lower levels of financial literacy, typically respondents, irrespective of age, are found to have low levels of financial literacy.

2.6 Assessment of Consumer Behaviours in Financial Literacy Instruments

Many personal financial literacy instruments have sought to analyse consumer behaviours within the context of primarily financial knowledge scores. Drawing from the organisational definitions of financial literacy as presented in Section 2.2.1, Kempson, Collard and Moore (2005) included the ability to "make decisions with an awareness of the likely financial consequences" as a component of financial literacy. PACFL wants individuals to "manage financial resources effectively for a lifetime of financial well-being", and the OECD/INFE would like people to "make sound financial decisions and ultimately achieve individual financial wellbeing." In general, these organisations would like individuals to put their knowledge into action to make sensible financial decisions.

For example, Chen and Volpe (1998) differentiated financial behaviour between intention and action in managing personal finances. Both the high and low financial knowledge survey groups responded that they viewed keeping financial records as necessary (95% and 92% respectively), but when assessed in terms of actual behaviour, about 25% of the less knowledgeable group kept no financial records at all. Similarly, although 81.3% of the less knowledgeable group confirmed that spending less than their income was necessary, only 68.3% of this group made the correct choice when presented with a hypothetical scenario.

The relevance of testing for financial behaviour instead of only knowledge is further illustrated by the 2003 Washington State DFI study, which found significant differences between a general sample and a victim sample, which had fallen prey to predatory lending. Thus, the victim group had lower financial knowledge levels and a higher rate of financial experience with credit and loan markets but lower financial experience levels with long-term planning and investing. This group tended to spend more and save less and engaged in more negative financial behaviours than the general group (Moore, 2003).

Thus, while the objective is good financial behaviour, which is often defined as the propensity to plan, participation in financial markets (investing in equity stocks or mutual funds), and the ability to manage debt, many studies have found that poor financial behaviour is demonstrated by respondent groups with lower financial knowledge levels.

This study, like the multidimensional conceptualisation of financial literacy used by OECD/INFE in their various personal and business frameworks, incorporates the financial behaviour dimension into the composite financial literacy score (together with knowledge and attitude) rather than surveying behaviours but then analysing the relationship between financial knowledge and behaviour. Essentially, to be considered financially literate in a multidimensional context, a respondent must have good knowledge and good behaviours and attitude.

The consumer behaviours tested focused on personal debt levels and usage of debt facilities, planning behaviours, and wealth accumulation and investing behaviours. While these behaviours are assessed with a personal context, behaviours around debt usage and planning (including budgeting) are essential within a business context. The sections below highlight some of the behaviours observed from personal financial literacy survey groups.

2.6.1 Debt Behaviour

Using the first (1997) Jump$tart Coalition survey results, in 1998, author and researcher Lewis Mandell testified before a subcommittee of the US House Judiciary Committee tasked with evaluating bankruptcy legislation. He observed that in those States where students across the State achieved the mean financial literacy score (55.6%), the rates of personal bankruptcy filings were high, and conversely, in States with low levels of personal bankruptcy, the mean financial literacy score for the State was significantly higher (70.3%). While Mandell did not make any assumptions about causation, the results provided some indication that a link between financial literacy (knowledge) and the ability to manage debt exists (Duguay, 1998).

Lusardi and Tufano (2015) focused on debt literacy as a more specific subset of general financial literacy and segmented their respondents by behavioural group based on their survey results. It was found that a distinctive characteristic to separate and cluster groups was the usage (or not) of a revolving balance facility on a credit card, where the latter is a portion of credit card spending that remains unpaid at the end of each payment cycle, with the outstanding balance never being fully paid. In addition to having a revolving balance, an additional group tended to incur fees on their credit cards. Financial services providers levy credit card fees when the user pays below the minimum required, are late with their payment, exceeds the credit limit on the card, or uses it to obtain a cash advance. These actions would therefore constitute poor financial behaviours. Not surprisingly, it was found that those clusters of respondents who paid the most in credit card fees

and accessed the most expensive forms of borrowing had lower levels of debt literacy, although the study made no assumptions on causality.

In analogous work, Lusardi and de Bassa Scheresberg (2013) showed that respondents who accessed high-cost borrowing like payday loans, pawnshops, car title loans, rent-to-own or refund anticipation loans, as measured by the Big Three in the 2009 US National Financial Capability Study (NFCS), had low levels of financial literacy. Similarly, in a UK study, Disney and Gathergood (2013) found that households with low financial literacy levels hold a more substantial portion of high-cost debt than respondents with higher financial literacy levels.

Lastly, Agarwal, Skiba and Tobacman (2009) showed that payday loan usage almost doubles the probability of credit card delinquency in the following year, making their usage very much a poor financial decision.

2.6.2 Planning Behaviour

In a study to uncover why some households with similar preferences end up with very different levels of wealth, Ameriks, Caplin and Leahy (2003) found that the inclination to plan was strongly associated with the accumulation of wealth and the formulation of a household budget. These authors suggested that "effortful self-control" enables this planning behaviour and the adherence to a plan, resulting in the building of savings and wealth.

An examination of the results from the HRS 2004 survey and the use of a multivariate probit model allowed Lusardi and Mitchell (2005) to confirm that financial literacy, as measured by the financial knowledge questions, is strongly and positively associated with planning. It was further found that knowledge about risk diversification is useful in differentiating between sophisticated and unsophisticated respondents and that respondents who cannot answer the knowledge questions are less likely to plan and succeed in their planning efforts. Out of the whole survey sample, just 18.5% of respondents (the successful planners) could plan for retirement and actually "stick to the plan". Further, financial knowledge and planning were observed to be interrelated; planners answered more financial knowledge questions correctly than the overall sample.

Whereas a straightforward approach to determining a financial literacy measure was used in the above HRS study, Lusardi and Mitchell (2007) subsequently went a step further by creating a financial literacy index in their study using the ALP data. In this study, respondents' scores on the financial literacy index and propensity to plan financially were positively and statistically significantly correlated.

2.6.3 Investing and Wealth Accumulation Behaviour

Behrman et al. (2012) found that higher levels of financial literacy increased the likelihood of households contributing to their pension savings and therefore increasing their net wealth. Authors van Rooij et al. (2011) studied the relationship between financial literacy and stock market participation as part of the 2005 De Nederlandsche Bank (DNB) Household Survey and found that after controlling for demographic variables, owning stocks increased with financial literacy, particularly among respondents with advanced financial literacy levels. Again, it was difficult to establish causality, but there was undoubtedly a relationship between the level of financial literacy and the likelihood of owning investments.

Van Rooij, Lusardi and Alessie (2012) extended the work of van Rooij et al. (2011) in an evaluation of the DNB survey data by establishing evidence of a definite link between financial literacy and wealth accumulation. Similarly, using a life-cycle model, Lusardi, Michaud and Mitchell (2017) found, quite strikingly, that different levels of financial knowledge explain 30-40% of retirement wealth inequality. They propose that higher levels of financial knowledge allow consumers to better allocate resources (the cost of acquiring appropriate financial knowledge) to the process of wealth accumulation. Van Rooij, Lusardi and Alessie (2012) suggest two mechanisms through which a higher level of financial literacy can lead to more considerable wealth accumulation. It was proposed that individuals with higher levels of financial literacy have a lower cost of gathering information about investment or wealth accumulation opportunities and that, as discussed in Section 2.6.2, individuals with higher levels of financial literacy are more likely to plan appropriately for retirement and adhere to the plan, thus growing their wealth.

2.6.4 Understanding Consumer Behaviours

Many researchers have observed evidence of poor consumer financial behaviour, particularly when it comes to managing consumer debt, the propensity to plan and adhere to the plan for the future, and the ability to build personal wealth. However, few studies have sought to explain why poor financial behaviour occurs. In this regard, Hastings and Mitchell (2011) proposed that a lack of knowledge together with a tendency towards impatience could explain sub-optimal financial behaviour. A tendency towards impatience is a financial attitude, and the fact that a financial attitude may explain financial behaviours suggests that financial attitude is a dimension of overall financial literacy.

As part of a 2009 Chilean Encuesta de Protección Social (EPS) survey, a novel game-based mechanism was devised to test the tendency towards being impatient; in other words, choosing immediate gratification over longer-term benefits; a test of financial attitude. Based on this, it was possible to classify respondents as impatient, efficacious deferrers or inefficacious deferrers.

Impatient respondents tended to have lower retirement savings and lower financial literacy scores. The researchers suggested that both low levels of financial knowledge and predisposition towards impatience shape a respondent's propensity to plan sufficiently for retirement (Hastings & Mitchell, 2011).

As discussed in Section 2.3.3, Strömbäck et al. (2017) incorporated self-control, together with financial literacy, in their survey to investigate consumer behaviour in Sweden. It was found that respondents with higher income levels, higher financial literacy scores, and good self-control were more likely to save money regularly; in other words, they displayed good financial behaviours. Similarly, Miotto and Parente (2015) studied lower middle-class households in Brazil and found those individuals with lower self-control levels and less predisposition to budget and plan within the household tended to have higher incidences of bad debt or default. Likewise, Gathergood (2012) suggested that a lack of self-control, together with low levels of financial literacy, lead to increased use of high-cost borrowing and the likelihood of excessive debt. This study found that a lack of self-control in the form of impulsive behaviour, more than financial knowledge, provided evidence of over-indebtedness. Emmons (2005) also suggested that for individuals to practise proper financial management, they need various emotional skills, including self-discipline, resilience, self-control and the ability to not succumb to instant gratification.

These findings support the notion proposed by Hastings and Mitchell (2011) that the attitudes of individuals influence their financial behaviours and serve to support the OECD/INFE multidimensional concept of financial literacy that includes financial knowledge, behaviours and attitudes as interrelated dimensions.

2.7 Conclusion

Chapter 2 covered the concept of financial literacy and the various definitions, conceptual models and test instruments developed around this concept. While there is no consensus on a formal definition of financial literacy, there is a tacit consensus that financial literacy is not just a measure of financial knowledge and that behaviours and attitudes of individuals contribute to shaping their overall level of financial literacy.

Globally, levels of financial literacy remain low, individuals have low levels of knowledge, practice poor financial behaviours, and their attitudes, particularly around self-discipline, are not desirable for long-term financial well-being. Furthermore, almost universally, male respondents outperform female respondents, and wealthier and more educated respondents outscore poorer, less educated respondents. Aside from a lack of formal definition and standardisation of financial

literacy testing hampering cross-instrument comparisons, there is also a lack of standardisation of scoring methodologies and the provision of financial literacy scores to respondents.

Most importantly, the prior literature described in this chapter involved financial literacy research focused almost exclusively on individual consumers rather than financial literacy within a business context. While the OECD/INFE developed a Core Competencies Framework on Financial Literacy for SMMEs, there has been little prior research focussed on the business-specific conceptualisation of financial literacy.

Thus, there is a significant gap in the literature regarding the application of financial literacy concepts to the study of business financial literacy, which remains a nearly unexplored research topic. It is in this context that this study builds on the prior conceptualisations, definitions, instrument construction, scoring methodologies, and demographic and behavioural findings within personal financial literacy research to contribute to both academic literature and practice, specifically by developing a theoretical business financial literacy framework and designing and applying an instrument to measure entrepreneurs' business financial literacy.

Before constructing an instrument capable of measuring the level of financial literacy amongst entrepreneurs, there must first be a formulation of the content to be tested. The first step in the instrument construction process, namely the design of a financial competencies framework, is discussed in Chapter 3.

Chapter 3 A Business Financial Competencies Framework

3.1 Introduction

Much of the work examined in Chapter 2 covered the conceptualisation, definitions, test instruments and key demographic and behavioural findings of various global financial literacy studies. A large proportion of these studies examined individuals or households rather than entrepreneurs and indicated the importance of financial literacy at a personal or household level to enable individuals and families to properly manage their finances over their lifetimes.

However, this study proposes that a high level of personal financial literacy is just the foundation for a business's successful financial management. The skills or competencies required to increase the probability of business survival go beyond the knowledge, behaviour and attitudes required at a personal finance level.

Before constructing an instrument capable of measuring the level of financial literacy amongst entrepreneurs, there must first be a formulation of the content to be tested. This chapter outlines why it is essential for entrepreneurs to be financially literate and assesses the critical financial competencies applicable to running a business. Those critical financial competencies are used to develop a business financial competencies framework that serves as the underlying foundation for designing and developing a business financial literacy test instrument.

3.2 The Importance of Financial Literacy for Entrepreneurs

Anderson and Robinson (2018) agreed with van Rooij et al. (2011), who expressed concern that general financial knowledge may be insufficient to prepare financial consumers for specific but infrequent financial tasks like participation in the financial markets or selecting appropriate home financing. The opinion of these authors confirms the difference between domain-specific general financial knowledge and context-specific personal financial knowledge. Thus, a high level of general financial-domain knowledge is unlikely to be sufficient to allow an entrepreneur to make complex business-related financial decisions.

Two studies whose focus included business practitioners found a relationship between business solvency and financial literacy. Wise (2013) investigated the impact of financial literacy on new business survival in Canada, specifically whether an increase in financial literacy increased the probability of loan repayment and decreased the probability of involuntary business closure. He found that an increase in the entrepreneur's knowledge of financial statements and financial ratios lead to an increase in the generation of financial statements. The increased production of

financial statements, in turn, led to an increase in the repayment of business loans, which resulted in less involuntary business failures.

With similar findings, Dahmen and Rodríguez (2014) determined a clear relationship between inadequate levels of financial literacy and business financial distress. The businesses they examined did not regularly review their financial statements. For ten out of the fourteen case study businesses, the business owner did not understand the business gross profit ratio and its contribution to overall profit. For non-service-based businesses, gross profit is arguably one of the most fundamental and critical business metrics to evaluate.

Klapper, Lusardi and Panos (2015) show that higher levels of financial literacy as measured by the Big 5, not only influence the likelihood of an individual embarking on a path of entrepreneurship but that those entrepreneurs who exhibit higher financial literacy levels lead to better financial performance as proxied by the respondents' personal financial position.

Many studies have tried to identify what factors contribute to entrepreneurial success, and there are two avenues of research behind this somewhat elusive measure. de Mel, McKenzie and Woodruff (2011), referring to surveys of SMMEs in 54 countries, suggested financing constraints and access to finance was the common factor in these firms' failure or lack of success. Drexler, Fischer and Schoar (2014) argued that it was managerial capital or business skills that were critical. Eniola and Entebang (2017), drawing on work from Spinelli, Timmons and Adams (2011), proposed that the management of financing is an essential managerial competency.

Within a South African context, Bushe (2019) undertook an empirical review of prior literature addressing SMME failure and attempted to provide a framework for analysing the reasons for business failure. He concluded that SMMEs fail for multiple reasons. The principal reason or factor provided was entrepreneur incapacity, followed by environmental inauspiciousness and enterprise incompetence. The research then provided descriptive information and an explanation for the factor terms. Entrepreneur incapacity meant the entrepreneur lacked the knowledge, skill and aptitude to form and grow a successful business enterprise. The definition of entrepreneur incapacity provided in the research bears a substantial similarity to the definition of financial literacy, being a combination of knowledge, behaviour and attitude. Environmental inauspiciousness refers to an operating environment that is not conducive to business activity. Enterprise incompetence was the term given to describe a situation where the firm has grown to the extent that professional management rather than the founding team are required to enable business success.

For this study, the author proposes to classify the two research streams that explain success or failure as *external reasons for failure* and *internal reasons for failure*. External reasons for failure

include the inability to access external capital and various operating environment difficulties such as increased competition or economic or regulatory changes. In contrast, internal reasons speak mainly to a lack of managerial competency or human capital.

It would seem that these two explanatory factors are interlinked. A lack of business skills makes it difficult for entrepreneurs to engage with external counterparties, be they financial service providers or potential partners or suppliers. As a specific example, when an entrepreneur has to engage with a capital provider, they need to have the skills (and information available) in order to be able to present current or expected future financial data. The need to effectively communicate financial data implies that a degree of business financial literacy is critical in such a situation, recalling that financial literacy is not one-dimensional financial knowledge but also encompasses financial behaviour and financial attitude.

This study makes use of the dimensions of financial literacy proposed by the OECD, namely financial knowledge, financial behaviour and financial attitude (OECD, 2018). However, before proposing a formal definition and conceptualisation of business financial literacy for entrepreneurs, an examination of the critical financial competencies that underpin the conceptual model follows.

3.3 Critical Financial Competencies for Business

3.3.1 Introduction to Competency Frameworks

By way of introduction to what a critical financial competency framework might encompass, this section examines the OECD/INFE Core Competencies Framework on Financial Literacy for SMMEs published in 2018. To the best of the author's knowledge and investigation, the OECD/INFE Core Competencies Framework is the only such framework tailored for SMMEs in the public domain. The framework sets out the financial knowledge and skills that business owners and managers of SMMEs (or aspirant entrepreneurs) could find beneficial and behaviours to improve the management of their business finances and the attitudes supporting these business processes (OECD, 2018). Within this core competencies framework, the definition of financial literacy for SMMEs is as:

> "The combination of awareness, knowledge, skills, attitudes and behaviour that a potential entrepreneur or an owner or manager of a micro, small or medium-sized enterprise should have in order to make effective financial decisions to start a business, run a business, and ultimately ensure its sustainability and growth" (OECD, 2018).

The OECD document defines four primary areas of competency as:

- Choice and use of financial services
- Financial and business management and planning
- Risk and insurance
- Financial landscape

It also refers to the business's progression through various life stages: basic/informal; starting up/becoming formal; growing; closing. Although the document acknowledges that micro and small businesses often operate informally in developing and emerging economies, it encourages businesses to become formally registered. Many businesses will never become formal, particularly in emerging and developing countries, and never experience growth in employee numbers. Similarly, while a business may be formally registered in developed and developing markets, it may never experience growth in employee numbers (see Section 3.4.2 for a more extensive discussion).

Figure 3-1 below shows the framework structure proposed by the OECD/INFE:

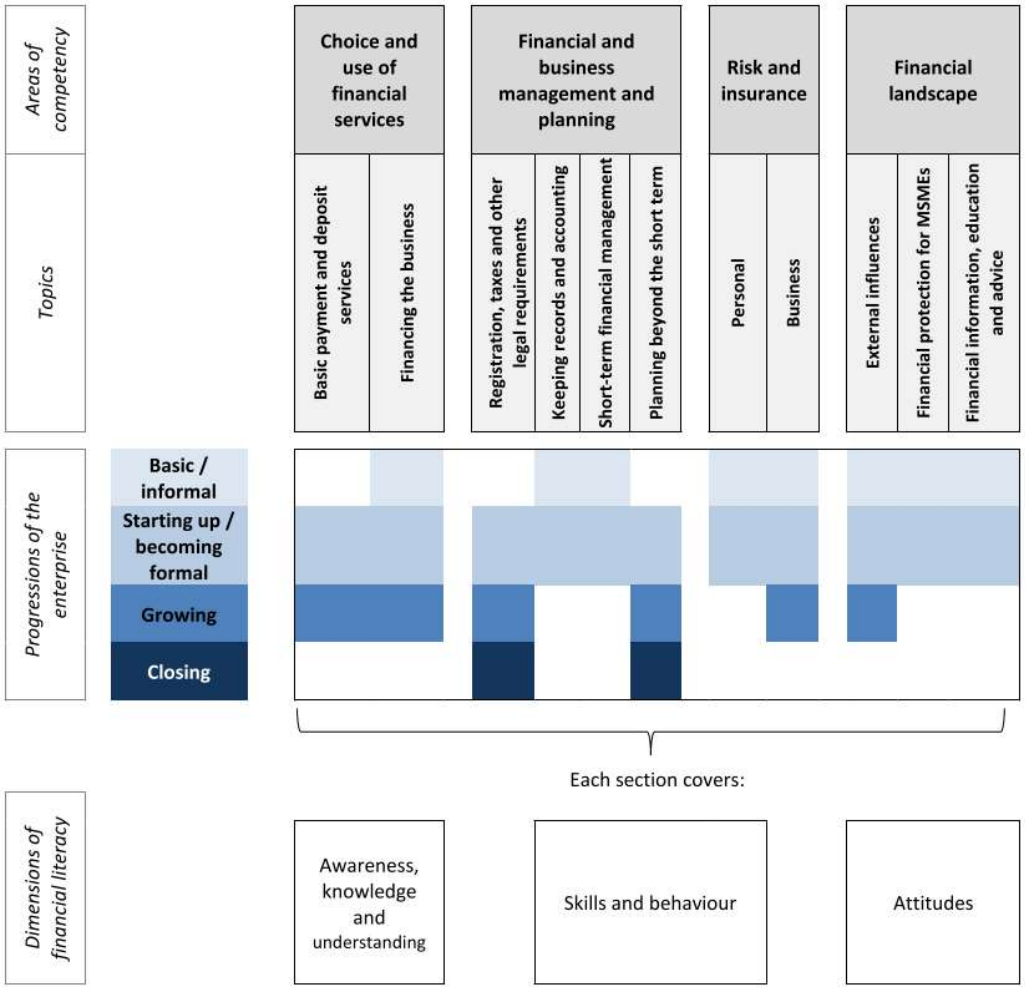


Figure 3-1: OECD/INFE Structural Framework for Core Competencies - OECD (2018)

Figure 3-1 indicates which areas of competency and the associated topics are critical for various life stages of the business. However, this study proposes that numerous entrepreneurs will never become formally incorporated businesses. Moreover, they may never seek to employ anyone beyond the business founder; in other words, they will *not* move through a business lifecycle progression as assumed by the OECD framework. If a business does not move through a lifecycle progression, then the topics associated with the business progression at various lifecycle stages may require revision. For example, the OECD framework excludes access to basic payment and deposit services and the capacity to plan beyond the short-term for basic/informal businesses. However, an operational, informal business should have competencies in these areas.

Therefore, this study proposes a reclassification of the enterprise status to accommodate instances where entrepreneurs do not formally incorporate their businesses and instances where businesses do not grow. Thus, a business status identification based on business size is applied as an alternative enterprise (business) classification rather than adopting a lifecycle approach. A business status identification caters to businesses that are likely to remain informal or choose not

to grow materially. Furthermore, it ensures two things: firstly, that higher-level topics do not exclude sole traders or non-growing businesses and, secondly, that higher-level topics reflect that financial complexity is unlikely ever to be appropriate for those businesses. As examples of the complexity that may never be appropriate, Table 3-1 presents a selection from the OECD/INFE framework from the starting up/becoming formal and growing business progression categories (OECD, 2018):

Example 1: An informal or even a formal business operating in a developing market may not have an array of business financing options available to it; initial coin offerings, peer-to-peer lending, mezzanine finance and the like are not typical in a developing market trading environment.

Example 2: In developed and developing markets, if a business does expand the business workforce beyond the sole trader, it is unlikely to formally comply with labour laws or the type of human resources functions (payroll, pensions, health care) typically found in formal, corporate environments.

Example 3: Informal and predatory lending is of genuine concern to frequently vulnerable, necessity-based entrepreneurs. However, a form of unregulated financing like an initial coin offering is unlikely to be available as a financing option for many entrepreneurs in developed and developing markets

Example 3: In an ideal world, businesses and their customers' rights would be adhered to; however, again, in an informal, developing market setting, there is unlikely to be any formal protection of rights or complaint and resolution processes in place. For a necessity-based entrepreneur living hand-to-mouth, these are likely to be seen as developed market luxuries.

Table 3-1: Excerpt from OECD/INFE Financial Competencies Framework

Example Number	Area of Competency	Topic	Details
1	Choice and use of financial services	Financing the business	• Understanding the benefits, risks, costs and limitations related to digital services and platforms for funding the business (such as crowdfunding, peer-to-peer lending and initial coin offerings) • Understanding whether a financing product is appropriate given the size and stage of development of the business (e.g. recognising that derivatives may not be suitable to microbusinesses)
2	Financial and business management and planning	Registration, taxes and other legal requirements	• Being aware of administrative and legal procedures related to hiring employees or apprentices (payroll, pensions, health care, safety, etc.) • Being aware of different options for managing employees' payroll and pensions (doing it one's self, paying/hiring an accountant) and of their respective advantages and disadvantages
3	Financial landscape	Financial protection for MSMEs	• Understanding the risks of dealing with informal and non-regulated financial products (such as initial coin offerings) and providers (such as informal money lenders) • Being aware of the role of financial regulator(s) concerning consumer protection for MSMEs • Knowing the rights of the business in the financial marketplace, including that financial service providers have a duty to treat the consumer fairly and transparently, to provide reliable services, and to ensure security of consumer's data • Being aware of mechanisms to handle complaints and resolve disputes with financial services providers

In a similar departure from a developed world instrument to measure financial capability, the World Bank and Russia Financial Literacy and Education Trust Fund (RTF) project team chose not to implement the UK Financial Services Authority financial capability survey in low- and middle-income countries. Instead, they replicated the process of survey creation. The rationale for the decision to create a new instrument rather than adopt the instrument in existence was the notion that elements of financial capability that are of importance in a developed market or high-income country may be different to those areas of importance within a low- and middle-income environment (Kempson, Perotti & Scott, 2013).

While some of the proposed OECD/INFE framework elements may be more suited exclusively to a developed market environment, the framework contains multiple critical competencies that entrepreneurs should possess irrespective of their business size or operating environment.

The remainder of this chapter adapts and builds upon the OECD/INFE Core Competencies Framework, with the ultimate objective of proposing a financial competencies framework appropriate for both developed and developing environments. Before addressing a competency framework, a selection of high-level competencies and business considerations covered in prior academic work is first assessed. These high-level competencies and business considerations include accessing capital, staying solvent, keeping financial records, dealing with financial services providers, and planning and budgeting. The assessment of these provides background and context for the proposed financial competency framework presented in Section 3.4. A high proportion of the prior research referenced in the following sub-sections is specific to work conducted in South Africa, where the exploratory study is undertaken. However, although referencing South Africa (and other emerging markets), the topics apply to both the developing and developed market environment. The inclusion of emerging market references emphasises that a globally applicable framework must cater to the operational realities of the developed and developing market environments.

3.3.2 Accessing Business Capital

Businesses require some form of capital for business activity to commence. Even the informal trader will have a requirement to finance the initial purchase of stock to sell. In a more formal or opportunistic setting, this might amount to human capital in the form of the input of time, knowledge or prior experience, and the entrepreneur's network connections. Alternatively, it might be the personal savings of the business founder. However, there will likely come the point where there is a requirement for external financing to drive business growth. External financing may not be capital in the traditional longer-term balance sheet sense (equity or debt). However,

it could be a form of financing through a credit facility from a supplier, or short-term credit from a regulated or non-regulated financial institution, in other words, working capital finance.

However, before a financial institution or even an unregulated supplier extends credit, they will want to understand the entrepreneur's credit risk profile and that of the business. This screening process that both the business and typically the business owners have to undertake can prove challenging, particularly for a new business with no prior financial records to assess. A common difficulty in a young entrepreneur's case is a low personal asset base that cannot serve as collateral. A lack of personal assets as a constraining factor was confirmed in the South African environment by Fatoki and Van Aardt Smit (2011), who found that a lack of collateral was critical in the commercial banking credit assessment process. In this instance, the entrepreneur will be judged incapable of providing personal suretyship, and a benefactor will have to stand as the guarantor against any lending. While the screening process before equity investment may be slightly less focused on cash generation abilities to service debt and more focused on business growth potential, equity investors will also conduct due diligence before taking a stake in the business.

A survey conducted in 2009 by the International Federation of Accountants (IFAC) and *The Banker* magazine of banking lenders in over eighty countries found that the primary considerations in the SMME lending decision were cashflow information, loan collateral and transaction history or account behaviour. The availability of business plans and forecasted or prospective financial information was also considered necessary (International Federation of Accountants, 2009).

Ultimately, both debt and equity providers evaluate the likelihood of the venture's success over the investment time horizon. Different providers of capital will assess this likelihood using different processes or frameworks for their appraisal. Frequently, the appraisal work cost dictates whether a particular provider of capital will consider the provision of financing to a small or start-up business. Intensive screening is not costless in terms of resources to the finance provider, and they will want to have some sense that they will sufficiently recoup these costs through participation in the business performance.

Nieuwenhuizen and Kroon (2003) engaged with South African development corporations and successful entrepreneurs to identify better qualitative success factors for the appraisal process. After undertaking a factor analysis on South African SMME data gathered through interviews and surveys, these researchers found that a factor they named ingenuity explained 41.52% of the variation of their 17 survey statements. The following six survey areas make up the ingenuity factor: financial understanding, financial management, bookkeeping for own advantage,

creativity and innovation, knowledge and skills regarding the enterprise, knowledge of competitors.

There is a perception that the typical entrepreneur is a creative and connected leader willing to take considerable risks to achieve business success. However, within a South African context, the research identified financial understanding, financial management and bookkeeping as essential success factors. These are arguably far less glamorous qualities than typically associated with entrepreneurs.

3.3.3 Staying Solvent

While entrepreneurs may have ambitious targets for business success, the most fundamental success indicator is survival rather than bankruptcy. In the much-used bankruptcy model and associated measure of business financial health, the Altman Z Score, Altman (1968) proposes the use of five financial ratios:

- Working capital/Total assets
- Retained Earnings/Total assets
- Earnings before interest and taxes/Total assets
- Market value equity/Book value of total debt
- Sales/Total assets

In more recent work, Altman and Sabato (2007) suggest, based on US SMME financial data, that a logit regression model containing the financial ratios below best predicts SMME bankruptcy probability.

- Earnings before interest and taxes/Total assets
- Short term debt/Equity book value
- Retained earnings/Total assets
- Cash/Total assets
- Earnings before interest and taxes/Interest expense

The objective of including details around corporate (and SMME) bankruptcy models, despite the intention to cater to both formal and informal business sectors, is to emphasise two elements. Firstly, financial services firms will use financial data of this nature when assessing the creditworthiness of a business and its suitability for being a loan recipient. Secondly, the derivation of these ratios is from fundamental accounting data. If there is no accounting data, there can be no financial ratios generated and thus no access to finance from formal (or informal) providers of business capital. There is no accounting data if the entrepreneur has no or limited

knowledge of this information's importance and business use and does not deem record keeping behaviours critical.

3.3.4 Financial Record Keeping

Webster, Hare and Mcleod (1999) found that in the European Union, the ability to maintain proper business records was essential to business operations and that those businesses that kept proper records showed improved performance relative to those businesses that did not. Ajibade and Khayundi (2017) investigated record management in South African SMMEs and suggested that a critical data point for monitoring business performance is sales data, yet only 4.35% of their (small) sample maintained sales data. They found that 96% of the respondents were unable to classify their business records correctly. Without proper classification and retention of business records, it is impossible to produce even lightweight financial statements.

Fatoki and Van Aardt Smit (2011) undertook to understand the constraints to credit access by new SMMEs in South Africa. They sourced their data from the provincial small business branches of South Africa's four primary commercial banks and trade creditors in the manufacturing, wholesale, and retail sectors. The nature of the entrepreneur applying for business financing from a regulated financial institution (commercial bank) is quite different from the entrepreneurs sampled by Ajibade and Khayundi (2017). When examining the bank data, the most critical factors were lack of collateral, lack of business information, and managerial competencies. The critical factor from the trade creditor data was the lack of business information. Business owners who do not adequately keep the underlying records or source documents cannot communicate business information about cash flows and business viability.

By examining a small group of informal sector women entrepreneurs in the KwaZulu-Natal province, Jiyane and Zawada (2013) note that they had limited knowledge of recording-keeping and stocktaking amongst the group most did not maintain records of their stock. The few who were able to keep records did it unprofessionally and used notebooks that did not show basic financial information like purchases, profits, losses to enable them to determine whether their business was profitable (Jiyane and Zawada, 2013).

The classification, storage and analysis of business records, or source documents, to use the accounting terminology, are ground zero for the compilation of business financial data.

3.3.5 Engaging with Financial Service Providers

Lusardi and Tufano (2015), Klapper, Lusardi and van Oudheusden (2014), Klapper, Lusardi and Panos (2013), Cole, Sampson and Zia (2011), Karlan and Valdivia (2011), Bruhn and Zia (2011), and Drexler, Fischer and Schoar (2014) all found a relationship between levels of financial

knowledge and the usage of financial services. Some of the studies mentioned above were household (individual) specific rather than business-specific. However, in business-specific findings, some of the financial knowledge increases were delivered through a business advisory training programme or intervention.

Bruhn and Zia (2011) found that entrepreneurs who displayed higher business and financial literacy were increasingly likely to use trade credit and maintain accounting records. They also found that where the business was formally registered, the entrepreneur had some form of prior learning, and the business had assets; these factors were predictors of financial services usage.

To understand the drivers of demand for financial services in emerging markets, Cole, Sampson and Zia (2011) discussed two alternative reasons for low engagement. The first possibility was that the expense of accessing financial services was prohibitive for low-income consumers, and the second suggestion was that low levels of financial literacy prevented consumers from engaging with financial service providers. To test these two theories, they offered a financial education programme to unbanked households and simultaneously, they offered small monetary subsidies to unbanked individuals if they opened a bank account. Those individuals who received training displayed no increased likelihood of opening a bank account, while those individuals enticed with a monetary reward showed a significantly higher probability of account opening. Additionally, they found these individuals were more likely to be using their accounts two years post-subsidy. This research methodology provided a thought-provoking finding. It indeed suggested that education programmes alone are insufficient to convert the unbanked to banked status. However, given the very low-income, developing environment location of the study (India and Indonesia), it is unsurprising that monetary reward led to action. Tangible, immediate benefits are always likely to win when individuals are living day by day.

While this finding suggests that some form of tangible incentive is appropriate to encourage the conversion to financial service usage in emerging markets, entrepreneurs, by their very nature, are not anticipating instant, immediate financial reward. Starting a business requires a degree of planning for the future, even when the entrepreneurial venture is necessity-based in motivation. Thus, even though there is no immediate, tangible value to acquiring knowledge skills, improving business financial literacy levels could improve outcomes when aimed at entrepreneurs rather than low-income households.

de Mel, McKenzie and Woodruff (2011) examined why Sri Lankan microbusinesses with high returns on capital could not secure credit from a financial lending institution. By providing intervention in the form of additional information about the lending facility and reducing the guarantor number for the loan (one rather than two), the lending institution doubled the proportion of firms receiving a loan. Therefore, the provision of product-specific information

(financial knowledge) positively impacted the accessibility and availability of credit funding. The repayment rates were high, and thus, the credit providers did not suffer from diminished credit quality on their lending book despite relaxing the lending conditions.

3.3.6 Planning and Budgeting

Maduekwe and Kamala (2016) undertook a study to examine the use of budgets by SMMEs in the Cape Metropole in South Africa. Their focus was on the types of budgets used and budgeting methodology, effectiveness and the factors that limited businesses from implementing a budgeting process. Budgets are important within a business for multiple reasons. In larger corporate environments, budgets allow for strategic and financial coordination between various corporate departments and provide a benchmarking tool for employee and business performance. Within the context of more formal SMMEs, budgets are critical in the capital-raising process. Part of the engagement with an equity or debt provider will be to present forward-looking budget material to map out the financial business expectations. A reasonable and realistic budget is an essential part of an SMME's business plan for raising capital (Maduekwe and Kamala, 2016).

A lack of skills and resources was the most often cited reason businesses did not undertake a budgeting process. Similar findings are reported by Mafukata (2015), who studied small-scale cattle farmers in the Vhembe District of Limpopo Province using surveys to measure budgeting, marketing, financial competence, and cattle-farming specific skills. Mafukata (2015) also found that budgeting and financial management skills were lacking amongst the sample group.

Fatoki (2014) found further evidence of a lack of financial planning or budgeting amongst micro-enterprises in the retail sector in South Africa. While the survey sample was a small group, all respondents indicated that they had never produced a statement outlining the financial objectives they hoped to achieve over the coming year. None compared their financial objectives to their actual financial performance, and 85% did not produce a budget of income and expenditure.

In a study undertaken in a developed market environment, Peel and Bridge (1998) looked at the use of strategic planning among UK-based SMMEs in the manufacturing sector. They found that profitability improvement, followed by sales growth, were the most critical strategic objectives amongst their sample group. Additionally, those businesses that were successful in attaining organisational objectives were those who a high degree of planning detail, suggesting that strategic planning is an integral part of improved business performance.

3.4 Business Financial Competency Framework

3.4.1 Introductory Considerations

Accounting data serves as the data underpinning the ability of the entrepreneur to make informed business decisions. It is not suggested that an informal sole trader needs to follow a formal or IFRS or US GAAP-compliant accounting process, but it is impossible to gain financial insights if primary financial data is not available. A high-level version of the accounting cycle comprises the following steps: source documents, journals, ledgers, trial balance, and financial statements. The cyclical accounting process may be undertaken in a formal financial accounting sense or from a more operational management accounting perspective. When formulating a financial competency framework, it helps keep the accounting cycle in mind as it forms the architecture underlying the operational business cycle.

It is also worth considering the ultimate objective of this study and other research that evaluates and measures financial literacy. The intended outcome is to provide financial education, support and intervention so that individuals can make the necessary financial decisions to start and manage a business and ensure it grows and is sustainable (OECD, 2018). Thus, research in this area must ensure that business financial literacy levels (based on identifying critical competencies for business viability) are measured. Measurement of business financial literacy levels enables researchers to identify weaknesses and provide and implement an appropriate education or training remedy.

When constructing the proposed financial competency framework, this study considered both the lens of the accounting cycle and the objective of education programme design. When designing an education programme, it is salient to map out the learning objectives before beginning with course content generation. This educational concept was pioneered by Benjamin Bloom, who, together with a group of specialists, published *Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook I: Cognitive Domain* in 1956. The taxonomy categorises six cognitive domain categories: knowledge, comprehension, application, analysis, synthesis, and evaluation. The domain categories, ordered in increasing complexity and abstraction, together present a cumulative hierarchy. In other words, before mastering synthesis and evaluation of a particular content item, the prior categories (knowledge through to analysis) would have to be achieved. The areas of financial competency and the associated topics are equivalent to the primary learning objectives (sections) and underlying content focus (sub-sections) of a financial education programme designed for entrepreneurs.

As discussed in Section 3.2, this study suggests internal and external reasons for business failure. To (at the very least) avoid business failure, it is suggested that there are critical internal and external competencies that must be included in the framework of financial competencies.

Another important consideration within a financial competencies framework is the classification of the enterprise progression and the associated competencies requirement at each stage.

3.4.2 SMME Growth Progression and Classification

The classification of SMME growth and stage has attracted research interest for two primary reasons. Firstly, to provide a framework for policymaking, and secondly, if the features of successful SMME growth are identifiable, this provides investors who wish to participate in firm growth with an additional tool for investment identification.

It has become common to identify SMME growth and progression through various stages of business development or enterprise lifecycle (McMahon, 1998). O'Farrell and Hitchens (1988), who critique stage models of SMME development, note that one of the criticisms is the assumption that all SMMEs will inevitably seek to move from one stage to another or fail in trying.

An often adopted or adapted model of SMME growth was proposed by Hanks et al. (1994), who undertook an empirical study and used cluster analysis to identify life-cycle enterprise stages. These researchers found a sequence of four developmental stages, where revenues and organisational size increased together with increased organisational levels. The developmental stages were labelled as start-up, expansion, maturity and diversification. Also found were an additional two clusters that did not fit with a traditional life-cycle model. These were *old small firms* that displayed employee numbers and organisational complexity similar to start-ups but were not showing sales growth and old *status quo firms.* Despite being larger and more similar to firms in an expansion phase, these status quo firms were not growing.

Lester and Parnell (2005) proposed a five-stage lifecycle model for enterprise progression: existence, survival, success, renewal and decline. They suggested that small businesses do not often move beyond their second stage, survival, or skip to the final decline stage, never passing through the success and renewal phases.

As introduced in Section 1.3 and Section 3.3.1, many businesses do not follow an enterprise progression lifecycle. Numerous informal businesses (the largest category of businesses in South Africa) will always remain informal. The owners do not aspire to become a formal operation and employ staff, and their necessity-based objective is to generate sufficient income for themselves and their families. The same is true of formal small businesses; many do not aspire to grow but are perfectly content with an appropriate income generation level. The income-generation

motivation (old small firms and status quo firms) is valid in developed and developing markets. In this study, an *enterprise status* classification, rather than an enterprise progression classification, is proposed. Specifically, an enterprise status approach does not assume the enterprise will move from one stage to the next.

Thus, the following enterprise statuses are proposed:

- Informal businesses and formal sole traders
    - *The business is not a distinct legal entity*
    - *The business may not comply with the regulatory environment (not registered for corporate tax) but may pay personal income tax*
    - *The business may not have employees but may make use of the services of contract workers*
    - *The business may employ individuals but may not comply with standard labour laws (employment contract, income tax deductions, remedial processes)*
- Formal microbusiness
    - *The business is a distinct legal entity*
    - *The business complies with the regulatory environment*
    - *The business employs a maximum of ten employees and may make use of the services of contract workers*
- Formal small business
    - *The business is a distinct legal entity*
    - *The business complies with the regulatory environment*
    - *The business employs a maximum of fifty employees and may make use of the services of contract workers*
- Formal medium business
    - *The business is a distinct legal entity*
    - *The business complies with the regulatory environment*
    - *The business employs a maximum of two hundred and fifty employees and may make use of the services of contract workers*

From the perspective of the exploratory South African-based study, and as indicated in Figure 1-2, the above "informal and formal sole traders" enterprise status classification encompasses informal sole traders (80% of informal businesses) and informal businesses that employ others, together with formal sole traders who make up a quarter of formal business.

In instances where informal businesses have employees in the South African context, very few will employ more than four individuals. While this study does not advocate non-compliance, given

the complexity of the formal regulatory frameworks, the reality is that an informal business is likely never to seek to comply with tax, labour or consumer protection laws voluntarily. This likely non-compliance is the basis for combining informal businesses and sole traders into one enterprise status category. As a precursor to the survey of South African entrepreneurs, which is undertaken and detailed from Chapter 5, it should be noted that informal South African entrepreneurs did not form part of the survey group.

A formal microbusiness and a formal small business do have employees (up to ten and fifty employees, respectively), and therefore there is a need for compliance with human resource best practices and labour regulations, in addition to tax regulations.

A medium-sized business with up to two hundred and fifty employees has a higher burden of competency in managing business operations, including the management of employees.

Business size classification is typically determined by employee number and, to a lesser extent, revenue turnover. The International Finance Corporation (IFC), a part of the World Bank Group, surveys and produces a global Micro, Small and Medium Enterprise Country Indicators dataset. Of the 155 countries surveyed, 92% define SMME categories by employee number, while 49% used a turnover measure. The most commonly used employee number threshold scale is two hundred and fifty employees for a medium enterprise, fifty employees for a small enterprise, and ten employees for a micro-enterprise (Gonzales, Hommes & Mirmulstein, 2014).

Within South Africa, the Minister of Small Business Development recently amended the definition of small business, classifying businesses as micro, small and medium based on full-time employee numbers and total annual turnover. The turnover categories vary dependent on the industrial sector in which the company operates, but employee numbers apply irrespective of industry. To be classified as a micro-enterprise, the business must have a maximum of ten employees. Small enterprises fall between eleven and fifty employees, while medium enterprises have more than fifty employees up to two hundred and fifty (Department of Small Business Development, 2019). Thus, the South African SMME definition is in line with global standards.

3.4.3 Areas of Business Financial Competency and Topics

Using prior research that seeks to address the reasons for business failure, or alternatively phrased, the explanatory factors behind business success, and as discussed in Section 3.2, this study proposes a classification of internal reasons for business failure and external reasons for business failure. The external reasons cover the dealing and interactions with parties outside of the business. These include customers and the economic climate in which the business operates, financial services providers, and regulatory authorities and regulations. Internal reasons are processes, operations and people inside the business. Thus, a classification of areas of

competency into Internal (operational) Competencies and External Competencies is proposed. Each of these two competency areas is then linked with associated topics, as presented in Figure 3-2. For reference, Figure 3-3 presents the equivalent OECD/INFE framework areas of competency and topics.

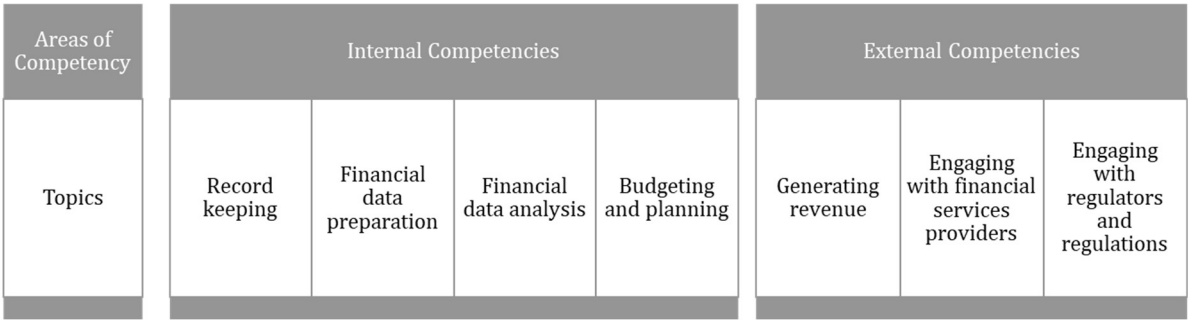


Figure 3-2: Areas of Competency and Topics

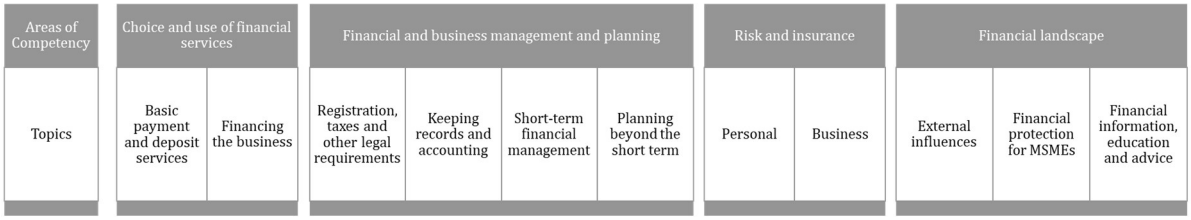


Figure 3-3: OECD/INFE Areas of Competency and Topics

3.4.4 Discussion of Internal Competency Topics

The accounting cycle framework is used as a guide to delineate the internal or operational competency topics. A high-level version of the accounting cycle comprises the following steps: source documents, journals, ledgers, trial balance, and financial statements. An additional step within the accounting cycle is the preparation of forward-looking documents, namely financial budgets. However, forward-looking documents must be grounded in reality; businesses should not propose wildly ambitious (or conservative) forward-looking financial goals. For those operational businesses, a budgetary process often flows from an analysis of the financial performance in the prior period, essentially an evaluation of the business's financial statements. While there is a requirement for strategic management input in the formulation of a budget, the raw data is numerical and financial.

For those businesses that are not yet operational, or if current operations are small-scale and do not reflect the owner and manager’s aspirations, the strategic input becomes more critical in producing financial forecasts. The lack of representative financial information tends to be the case in the start-up phase of a business. An entrepreneur may be beta-testing a business idea but has

not yet commenced full-scale operations. However, even at the preliminary stages of a business, following an albeit lightweight accounting process is essential.

The accounting process starts with record keeping, capturing the information found within financial source documents. As covered in Section 3.3.4, certainly within a South Africa context, Ajibade and Khayundi (2017), Fatoki and Van Aardt Smit (2011), and Jiyane and Zawada (2013) found record keeping abilities tend to be lacking. Record keeping as a process has classification and storage elements to it. Upon receiving a physical or electronic business transactional record, the business owner must determine the source document's nature; does this provide evidence of business income or expense? Does this provide evidence of an obligation, or it is a confirmation of a business asset? Following document classification, the entrepreneur must maintain a record (store) of the transaction in some loosely centralised system. While an informal, necessity-based entrepreneur may not have access to a formal business accounting system, maintaining financial records in paper-based books of account like journals or ledgers is possible. However, globally, smartphone technology has been embraced in developed and developing markets, and many people own smartphones. In a 2017 report, developed countries reported at least a 91% mobile phone penetration with 90% penetration in developing countries. Smartphone 2017 penetration was 80% in developed markets and 82% in developing markets (Deloitte, 2017).

Within South Africa, the Independent Communications Authority of South Africa (ICASA) defines a smartphone as a mobile phone with advanced features including Wi-Fi connectivity, the ability to browse the internet, a high-resolution touchscreen display and the potential to use applications (apps). The most recent ICASA report indicates that smartphone penetration in South Africa on 30 September 2018 was 81.7%. Additionally, 3G coverage within South Africa is at nearly 100% for both rural and urban populations (Independent Communications Authority of South Africa, 2019).

These ownership and coverage statistics mean that a high proportion of individuals have a smartphone and have access to a mobile phone network that would allow them to use online apps within the global and South African-specific operating environment. To a large degree, it means that entrepreneurs should not need to rely on paper-based financial record keeping but can use online document storage, spreadsheet-type applications, and, potentially, accounting software. Several online accounting software providers make a basic version of their software available for free. Therefore, those entrepreneurs not using these smartphone-accessible tools lack introductory and basic financial competency skills.

Without records, financial data preparation is impossible. Again, financial data preparation does not necessarily need to encompass the preparation of formal financial statements, but without tracking sales and expenses over the period, it is impossible to measure or improve the business

profitability and, hence, viability. Entrepreneurs may also be unaware of the broad financial preparation categories. Within a formal accounting process, these statements are classified as the statement of comprehensive income (income statement), statement of financial position (balance sheet) and the statement of cash flows. To assemble basic versions of these formal documents, entrepreneurs would need to understand the difference between income and expenses, revenue and profits, and profits and cash. They would also need a basic understanding of what constitutes an asset versus a liability to produce a rough balance sheet. To those well-versed in accounting, such distinctions may seem common knowledge, but the researcher's personal experience is that entrepreneurs who may be talented at providing a sought-after product or service, driving sales and motivating employees, often cannot distinguish between these items.

No financial analysis can be undertaken without the financial data in a broadly standard format (income statement, balance sheet, cash flow statement). Given that financial ratios form part of the credit-analysis decision-making process used by financial service providers (Section 3.3.3), entrepreneurs should, at a minimum, compute and evaluate their business margins (gross profit margin and net profit margin) as well as and the period-by-period change in various line items like sales, expenses, profits and cash. Particularly for those businesses where working capital is a material component of business operations, the measurement of inventory levels and the payment cycle between themselves and their customers and suppliers are critical to ensure business solvency.

Budgeting and planning require the entrepreneur to understand the difference between short-term business objectives, perhaps continued survival day by day and medium or long-term objectives for themselves and their business.

3.4.5 Discussion of External Competency Topics

At first glance, it may seem contentious to include revenue generation as an external competency topic rather than an internal measure. The decision to categorise revenue generation as an external competency stems from the use of introductory microeconomics. In microeconomic theory, the price at which a business can sell a product or service and the sales volume at that price is a function of market demand and supply for the product or service. There are micro and macro components to this economic function. At a micro-level, owners and managers can control their business efficiency (maximise business margins) and how they market their product or service (differentiation versus competitors). These are undoubtedly internal operational competencies. However, businesses operate within a macro environment. The economic and regulatory conditions of the market in which the business functions will dictate its ability to make revenue. Operating in a growing economy where individual and business customers have

increasing disposable income creates a macroeconomic tailwind for a business. In such an environment, the selling environment and, thus, revenue generation environment is more straightforward.

Conversely, in a slowing or stagnating economy, or one in which the regulatory environment is becoming more burdensome, the external environment begins to impinge on the business's ability to generate revenue. Thus, this study identifies revenue generation as more heavily contingent on the external operating environment than on the internal competencies of improving business margins and creating product or service differentiation.

Financial service providers (FSP), which includes investors, are all external parties with whom the business interacts. The FSP definition includes transactional banking and deposit-taking, short-term or long-term debt facilities, and potential equity investors. External providers of financing may not be regulated financial service providers - included in this category are unregulated (often predatory) lenders. Likewise, equity investors could be friends and family rather than formal venture capital or private equity investors. However, irrespective of the nature of the external provider of financial services, there tends to be an implied legal or contractual agreement between the two parties.

Similarly, the engagement with the regulatory environment and the regulators themselves may not occur via formal channels. However, for formally registered and operating businesses, there is (at minimum) a requirement for compliance with the tax regulations. Those formally operating businesses with employees will also be required to comply with labour laws and other regulations applicable to their specific industry. As mentioned previously, informal businesses are likely to sit outside of the regulatory framework, and given the complexity of the regulatory operating environment, they may be disincentivised from formalising their operations.

3.4.6 Mapping Financial Competencies against the Educational Taxonomy

Section 3.4.1 introduced Bloom's Taxonomy and suggested that areas of financial competency and the associated topics are equivalent to Bloom's primary learning objectives. The year 2001 saw the formulation of a revision to the original taxonomy that changed the knowledge dimension structure. The knowledge dimension now comprises four types of knowledge, and the result is a two-dimensional tabular structure to Bloom's taxonomy (Anderson, Krathwohl & Bloom, 2001). The knowledge dimension comprises factual knowledge, conceptual knowledge, procedural knowledge and metacognitive knowledge. Factual knowledge includes the knowledge of terminology and the knowledge of specific details and elements; conceptual knowledge encompasses knowledge of classifications and categories, principles, and generalisations and theories, models and structures. Conceptual knowledge includes subject-specific skills and

algorithms, techniques and methods, and criteria to determine appropriate procedures. Metacognitive knowledge covers strategic knowledge, knowledge about cognitive tasks, and self-knowledge (Anderson et al., 2001).

The Knowledge Dimension	The Cognitive Process Dimension					
	1. Remember	2. Understand	3. Apply	4. Analyse	5. Evaluate	6. Create
A. Factual Knowledge						
B. Conceptual Knowledge						
C. Procedural Knowledge						
D. Metacognitive Knowledge						

Figure 3-4: Bloom's Revised Taxonomy Table - Anderson, Krathwohl and Bloom (2001)

Additionally, in the 2001 revision, three cognitive process dimension categories were renamed, and the order of two of the categories was switched (Krathwohl, 2010). The newly formulated taxonomy presents a cognitive process dimension: remember, understand, apply, analyse, evaluate, and create. While the taxonomy presentation is often a hierarchical pyramid, Anderson, Krathwohl and Bloom (2001) maintain that the requirement to work within a strict hierarchy has been relaxed, and the categories overlap to some degree.

The PISA 2015 Financial Literacy Framework that sets out how scholars' financial literacy is measured and reported refers to the original Bloom's taxonomy. PISA defines the four process categories for financial literacy: identifying financial information, analysing information in a financial context, evaluating financial issues, and applying financial knowledge and understanding. This entity indicates that while their process categories use similar verbs to those found in the original taxonomy, it does not believe that financial literacy should be hierarchical attainment of skills, but that there should be a parallel achievement of the categories (OECD, 2017).

Figure 3-5 represents a graphical representation that maps the revised Bloom's taxonomy structural categories to a skill level categorisation for this study. The concept of hierarchy is maintained, but there is a degree of overlap within the skill levels.

Thus, at a basic skills level, there is an expectation that entrepreneurs would remember, understand and apply financial competencies. At an advanced skills level, the financial competencies would range across all of the taxonomy categories from remember to create, emphasising the ability to analyse, evaluate, and create within the financial competencies framework.

Additional to a span across the cognitive process dimensions, this study also proposes a span across the knowledge dimension. Basic skills require factual and conceptual knowledge, while advanced skills also incorporate procedural and metacognitive knowledge dimensions.

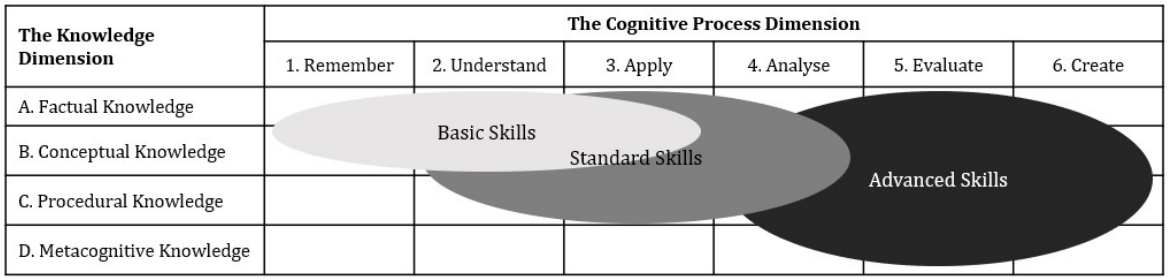


Figure 3-5: Skills Levels Mapped to Bloom's Revised Taxonomy Categories

The following exercise determines at which skill level each business status should possess a particular financial competency. In order to remain operational and potentially successful, basic reasoning would suggest an informal business would not require the equivalent skills as a formal, medium-sized business across all competencies. It may be appropriate for an informal business or sole trader to have basic skills and the ability to remember, understand, and apply in a particular area of their business without needing advanced evaluation and creation skills.

3.4.7 Proposed Business Financial Competency Framework Structure

The figure below (Figure 3-6) echoes the structure of the OECD/INFE Core Competencies Framework on Financial Literacy for MSMEs (Figure 3-1) as a basis. However, it modifies the proposed areas of competency and associated topics discussed in Section 3.4.3 and the classification of enterprise status discussed in Section 3.4.2.

Ahead of Figure 3-6, Table 3-2 summarises the definition of the dimensions of financial literacy, the competencies and the topics adopted for the proposed competency framework.

Table 3-2: Definitions of Dimensions, Competencies and Topics

Label	**Definition**
Dimensions	
Knowledge	Competencies related to information already acquired.
Behaviour	Competencies related to actions taken and the frequency of those actions
Attitude	Competencies related to internal or psychological state.

Competencies	
Internal	Competencies related to processes, operations, and people inside the business.
External	Competencies related to customers and the economic climate in which the business operates, financial services providers, and regulatory authorities and regulations.
Topics	
Record Keeping	Competencies related to the classification, storage and analysis of business records or source documents.
Financial Data Preparation	Competencies related to the classification, recording and presentation of financial, transactional data.
Financial Data Analysis	Competencies related to the review, analysis and computation of important financial ratios using financial data.
Budgeting & Planning	Competencies related to the forward-looking analysis of financial position and financial data for the short and longer term.
Revenue Generation	Competencies related to the operating environment, the pricing of goods and services, and the related cost of such goods and services.
Engaging with Financial Service Providers	Competencies related to relationships with financial services providers including providers of capital, transactional banking providers, and other financial services providers like accountants, tax practitioners and auditors.
Engaging with Regulators and Regulations	Competencies related to the regulatory environment and compliance with such regulations, including tax regulations, consumer protection regulations and employee regulations.

The proposed competencies incorporate the mapping of the suggested skills level for various enterprise statuses. These skills levels are related to Bloom's Revised Taxonomy of educational structure, as presented in Section 3.4.6 and visually represented in Figure 3-5. For reference, the

shading represents the skills levels, the lightest shading representing basic skills, the mid shading representing standard skills, and the darkest shading representing advanced skills.

Thus, informal businesses and sole traders should have advanced skills in the internal competency topic of record keeping and the external competency topic of generating revenue. Such advanced skills would require the informal business operator or sole trader to have higher-order skills to analyse, evaluate and create within those two topics to be deemed sufficiently competent. In contrast, the informal business practitioner or sole trader requires only basic skills when considering the topics of financial data analysis, budgeting and planning, and engaging with FSPs and regulators. Basic skills do not mean that there is no skill required. Instead, the skill level is at a lower level and covers the ability to remember, understand, and apply factual and conceptual knowledge. It is proposed that informal businesses and sole traders have standard skills under the topic of financial data preparation.

This study further proposes that medium businesses should have advanced skills across all internal and external competency topics, while informal businesses, sole traders, micro and small businesses encompass a blend of skill levels.

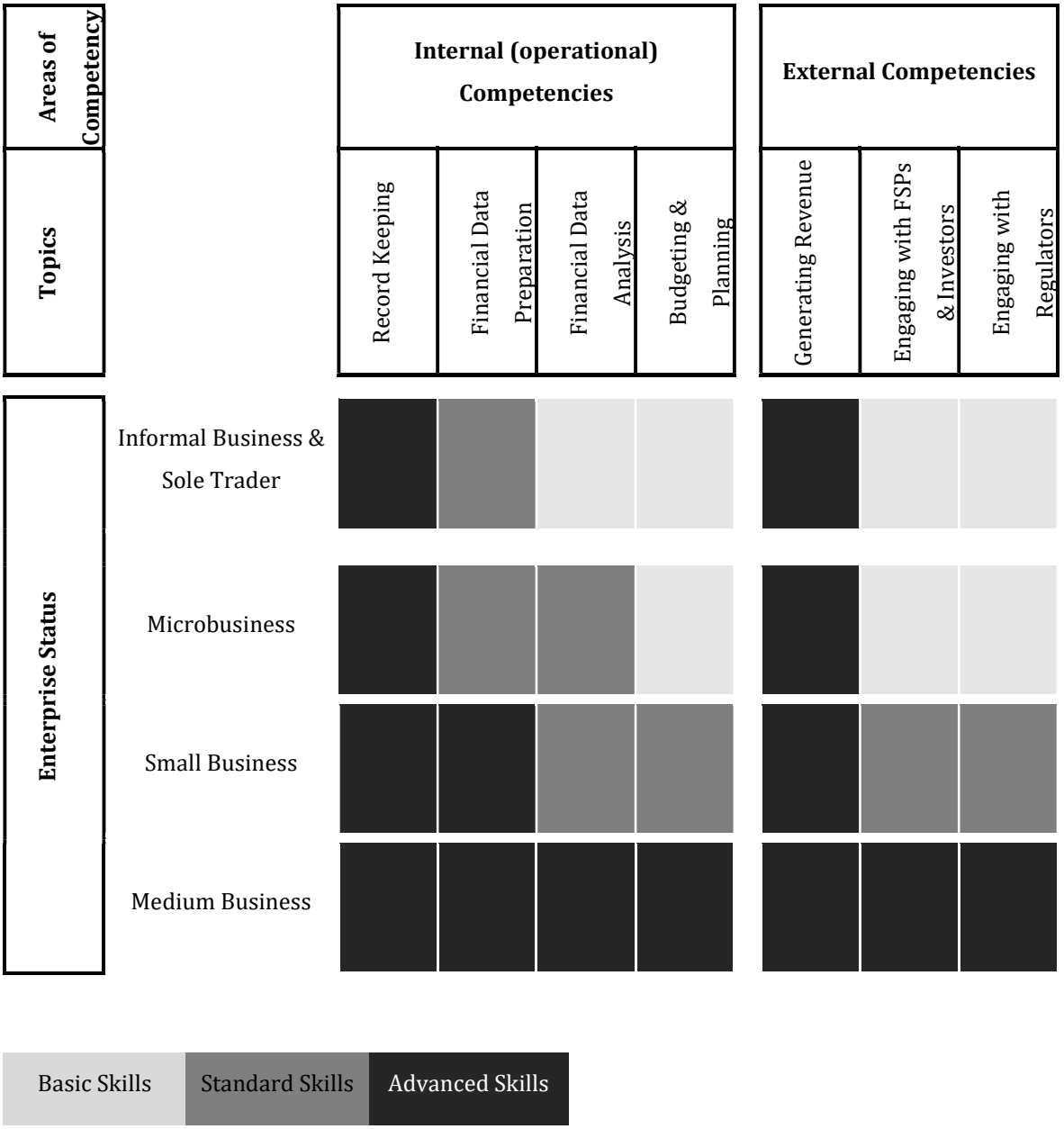


Figure 3-6: Proposed Business Financial Competency Framework

3.5 Functional Business Financial Literacy

3.5.1 Revisiting the Concept of Literacy

As discussed in Section 2.2.1, Hung, Parker and Yoong (2009) and Huston (2010) demonstrate that many authors conducting financial literacy-related work fail to include a definition of financial literacy or propose a conceptual model of financial literacy. Table 2-1 demonstrates the omission of planning from all the organisational definitions of financial literacy, and Table 2-2 provides a summation of the visual representations of financial literacy proposed by various authors.

Before defining financial literacy within this study's context, it is useful to examine the concept of literacy from other areas. Typically, literacy is associated with reading and comprehension. The OECD conducted a global survey with multiple governments, research institutions and agencies as contributors in the formation of the Adult Literacy and Life Skills Survey (ALL). The ALL Survey was an extension of the International Adult Literacy Survey (IALS) undertaken by the OECD between 1994 and 1998. Both surveys defined skills proficiency as falling on a continuum of proficiency rather than a binary literate versus illiterate classification. The ALL survey includes numeracy and problem solving as new domains in addition to the prose literacy and document literacy contained in IALS. A committee-formulated definition of literacy defined in the IALS and adopted in ALL is as follows:

> "Literacy is using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential" (OECD Publishing, 2011).

The phrase "to function in society" indicates that literacy allows individuals to contribute to and benefit from the social environment in which they live.

Similarly, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) defines functional literacy as:

> "[A] Person who can engage in all those activities in which literacy is required for effective function of his or her group and community and also for enabling him or her to continue to use reading, writing and calculation for his or her own and the community's development" (UNESCO Institute of Statistics, 2019).

The now generic term *functional literacy* was originated by the US Military during World War II and was said to represent the basic capability to understand written instructions necessary for conducting military functions and tasks (de Castell, Luke & Maclennan, 1981). In 1947, the US Census Bureau classified adults as functionally illiterate if they had fewer than five years of schooling. This education attainment classification has since moved to high school completion, but being educated does not necessarily equate with being functionally literate (Perry et al., 2018). In the field of literacy research, as with financial literacy, there is no universally accepted definition of what it means to be literate. However, several official definitions promoted by organisations like UNESCO and the OECD appear to have become the formalised definition(s) of what it means to be literate through their repeated academic use.

The research work conducted in literacy, particularly adult literacy, highlights the nuances between knowledge: the ability to read (often linked to educational attainment); and behaviour: the ability to interpret, comprehend and act on written text to be a functional adult.

Similarly, as assessed by multiple organisations and agencies, the related field of numeracy (numerical literacy) has no universally accepted definition. The term numeracy is referred to by various terms: mathematical literacy, functional mathematics or computational ability. In the OECD Education Working Papers, the Program for the International Assessment for Adult Competencies (PIAAC) Conceptual Framework on Numeracy suggests that numeracy is required so that individuals can cope with a range of situations that they may encounter in daily life. The description of these situations is as generative situations, interpretive situations, and decision situations. Generative situations require people to have the ability to count, measure, quantify and directly manipulate numbers. Interpretive situations require individuals to make sense of and grasp the implications of numerical information. In a decision situation, individuals find and consider information to make a decision, often requiring the weighing up of conflicting potential outcomes (OECD Publishing, 2009). While numeracy and the ability to use numerical information form part of the foundational layer of scholastic literacy (see Figure 1-1) and are a prerequisite to the domain and context-specific layers, numeracy alone does not signify domain and context-specific financial literacy knowledge or skills.

While the concept of being functional is a central dimension of being both literate and numerate to navigate life, in a review of academic papers, only one academic paper could be found that incorporated the concept of being functional with being financially literate. The paper by Winstanley et al. (2018) examined the financial capability and *functional financial literacy* in young adults with developmental language disorder (DLD). The authors defined functional financial literacy as the ability to cope with regular, daily monetary transactions that required real-time decision making, and thus, the focus was on the practical skills that the respondent group needed to navigate daily life.

"Functional" as an adjective has several meanings but is typically associated with being practical, useful, in working order and related to how something operates. These concepts are associated with action and implementation rather than the theory or knowledge of the activity.

SMME owners and managers need to have the competencies to ensure their business is functional and operates as intended. A component of that operation is ensuring the business is financially functional, that the financial machine, in other words, the business cycle, operates.

3.5.2 Defining Functional Business Financial Literacy

This study proposes functional business financial literacy as a critical attribute that requires measurement and evaluation. Functional business financial literacy needs to incorporate knowledge of financial processes and computations but must contain a practical, behavioural

element and positive attitude towards business finances that are of equal importance to knowledge and understanding.

Functional business financial literacy for entrepreneurs (current and prospective), inclusive of business owners and managers of SMMEs, is defined as follows:

> *The combination of knowledge, behaviour and attitude competencies that a current or potential entrepreneur should have to make effective operational and strategic financial business decisions for the current and future operating environment.*

The inclusion of knowledge, behaviour and attitude as dimensions of a composite measure of functional business financial literacy aligns with the OECD/INFE definition of financial literacy for individual consumers (Atkinson & Messy, 2012) and the OECD/INFE definition for SMMEs (OECD, 2018).

Historically, financial literacy survey instruments have been skewed towards the knowledge dimension, testing individuals' knowledge of concepts, such as compound interest, inflation and diversification: domain-specific knowledge. Increasingly, the behaviour dimension is taking greater prominence within administered instruments, but there remains a tendency to under-represent the number of behavioural questions relative to the number of knowledge questions. The incorporation of financial attitude is typically a one-question measure of confidence, and indeed, by question number, is not given the prominence of the assessment of either knowledge or behaviour. However, as discussed in Section 2.6, attitude, particularly self-control, is interlinked with behaviour.

A key purpose of this study is to design a survey instrument that emphasises the importance of financial behaviour and the associated attitude from a practical, functional perspective. The inclusion of the phrase "effective operational…financial business decisions" within the proposed functional business financial literacy definition is to capture the operational, daily financial processes and willingness of the respondent to undertake tasks sometimes perceived as dull. However, this is not to suggest that practical skills are not required to make strategic financial decisions. There is undoubtedly a functional component to being more forward-looking. However, operational decisions are the daily implementation of strategic decisions. By including operational and strategic financial business decisions, the definition intends to convey the practical competencies required to keep the business functional each day (bottom-up) and the overarching planning and forecasting (top-down) to ensure business success and longevity - in other words, to operate a viable business.

It is further argued that the dimensions of financial knowledge, financial behaviour, and financial attitude support and influence each other. A positive attitude towards finance and numerical

financial data could provide the impetus for entrepreneurs to seek out the appropriate financial knowledge to improve their potential for business viability. This learning could then support positive financial behaviour, which then reinforces the confidence or attitude. Equally, a lack of confidence may be hard to overcome, so the entrepreneur does not seek information that may improve financial decision-making. Similarly, a lack of self-discipline resulting in instant gratification taking priority over longer-term strategic planning may erode business viability. Therefore, behaviours that would be considered "good" are also not implemented. The dimensions can, therefore, have a constructive or destructive influence on each other.

3.5.3 Conceptual Model of Functional Business Financial Literacy

A conceptual model is a visualisation that demonstrates the primary elements, including the critical factors, concepts or variables and the supposed relationships between them (Miles, Huberman and Saldaña, 2014). Using the proposed definition of functional business financial literacy and the relationships between the dimensions of financial literacy, Figure 3-7 below presents a proposed conceptual model of functional business financial literacy.

In this proposed conceptual model, the dimensions of knowledge, behaviour, and attitude influence each other and aggregate together to arrive at a composite functional business financial literacy measure.

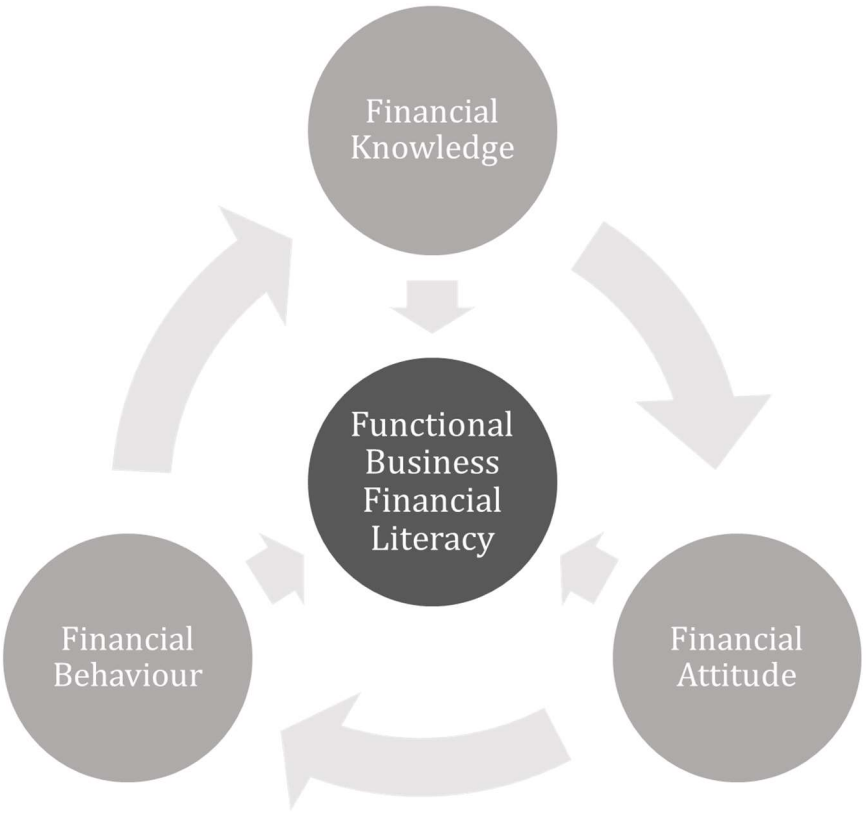


Figure 3-7: Conceptual Model of Functional Business Financial Literacy

3.5.4 Integrating Financial Business Competencies with Functional Business Financial Literacy

Thus far, this document has presented and introduced the following frameworks and definitions:

- An enterprise status (size) classification – Section 3.4.2
- A skills level taxonomy – Section 3.4.6
- A financial competency framework – Section 3.4.7
- A definition of functional business financial literacy – Section 3.5.2
- A conceptual model of functional business financial literacy – Section 3.5.3

As the intended outcome of this work is the formulation of a test instrument that provides a robust and valid measure of the business financial literacy of entrepreneurs, this requires testing the proposed financial competencies against the three dimensions of financial literacy (knowledge, behaviour, attitude) using the skill level appropriate for a particular business status (size) to generate a business financial literacy score.

The financial business competency framework proposed a split of financial competencies into internal and external competencies. Internal competencies are comprised of the topics of record keeping, financial data preparation, financial data analysis, budgeting and planning, while

external competencies include the topics of revenue generation, engaging with FSPs, and engaging with regulators and regulations.

The following statements propose a method of interpretation of the dimensions of financial literacy:

- Financial knowledge – what does the entrepreneur know?
- Financial behaviour – what does the entrepreneur do?
- Financial attitude – what does the entrepreneur feel?

The notion proposed in Section 3.4.1 when establishing the financial business competency framework was to consider this study through both the lens of the accounting cycle and the objectives of education programme design. While the framework areas of competency and associated topics show at a high level what competencies entrepreneurs should have, there is a requirement to drill down into the presented topics to establish at a granular level what it means to be competent from a knowledge, behavioural and attitude perspective.

When designing a programme of study, an educator has to answer the underlying question "what is worth learning?" and similarly, from a business perspective, it is essential to determine what an entrepreneur should know, do and feel about and towards the management of their business finances.

Using their proposed framework structure, the OECD/INFE Core Competencies Framework details the knowledge, behaviour, and attitude required for each topic and the enterprise progression level, as discussed in Section 3.3.1. To some degree, this detail is a best practice schedule for those individuals making the operational and strategic financial decisions for their business. Again, adopting a similar methodological approach to the OECD/INFE, the following section maps out a best practices structure using the financial competency framework detailed in Section 3.4.7.

3.5.5 Functional Business Financial Literacy Best Practises

The OECD/INFE Core Competencies Framework specifies detail based on enterprise progression level for each competency and associated topic across the three proposed dimensions of financial literacy. The following table is an excerpt from the OECD/INFE document to provide an example of their framework detail (OECD, 2018). The excerpt shows the first topic (basic payment and deposit services) from the competency, choice and use of financial services across the three dimensions of knowledge, behaviour and attitude.

Table 3-3: Excerpt from the OECD/INFE Core Competencies Framework for MSMEs

Competency: Choice and use of financial services

	Topic: Basic payment and deposit services		
	Awareness, knowledge and understanding	Skills and behaviour	Attitudes
Starting-up/Formal	Understanding the potential advantages, constraints and implications of accessing and using formal payment and deposit products and services	Choosing the most appropriate payment and deposit services, including digital ones, for the business needs, taking into account relevant factors, including price, costs associated with transactions, quality and breadth of service provision, supplier and customer preferences, and other conditions of the offer	Being confident to speak to financial services providers about the needs of the business
	Being aware of basic payment and deposit services for the business, including digital ones, and of their costs	Shopping around for different financial providers and products	Being confident to shop around for payment and deposit products and services for the business
	Being aware of fees associated with payments received from clients, such as fees associated with using point-of-sale (POS) or contactless terminals	Creating separate transaction, payment, deposit and savings accounts for personal purposes and for the business	
Growing	Being aware of costs related to currency exchange and transactions in a foreign currency	Being able to carry out business transactions in a foreign currency, if relevant	Being confident to carry out business transactions in a foreign currency
		Reviewing regularly the suitability of transaction, payment and deposit services and changing when necessary	

(OECD, 2018)

This study proposes an alternative approach to the presentation of best practises items for each topic. Rather than showing different detail based on the level of enterprise progression, this study provides a master list of detail that holds irrespective of the proposed enterprise status classification (informal business and sole traders, microbusiness, small business, medium business). The intention is to overlay the skills levels mapped to Bloom's Revised Taxonomy Table, as outlined in Figure 3-5, to formulate and measure test instrument items appropriate for the enterprise status.

The list of best practices for each competency and topic is compiled, drawing from the researcher's experience operating various entrepreneurial ventures and teaching and guiding various entrepreneurial businesses about business finances. Additionally, the best practices list incorporates the advice and input of various practitioners' with experience in operating and advising SMEs. Section 5.4 provides further detail on this approach and expert input as part of the instrument construction methodology.

Literature in the area of best practices for entrepreneurs is typically developed and published from a practical standpoint rather than a theoretical one. While adherence to rules is mandatory from a regulatory perspective, there are no rules for operational or strategic financial decision-making. It is an area where a practitioner is likely to trump a theorist in much the same way that Drexler, Fischer and Schoar (2014) showed a basic rule-of-thumb following financial heuristics rather than accounting theory was more impactful in improving a firm's financial practises.

Table 3-4 below sets out the composite business financial best practices for entrepreneurs applicable across all enterprise statuses in the researcher's view.

Using the financial best practice across the functional business financial literacy dimensions of knowledge, behaviour and attitude and overlaying Bloom's Revised Taxonomy skill levels for different enterprise statuses, the study now has the framework available to devise the functional business financial literacy survey instrument items.

Table 3-4: Business Financial Best Practices for Entrepreneurs

Internal Competencies		
Record Keeping		
Knowledge	Behaviour	Attitude
: know the different categories (invoices, receipts, delivery notes, quotes and others) of business records : know how to identify which category a business record belongs to : know how to store business records appropriately : know how to retrieve information from business records appropriately : know that transactional records are the evidence of business transactions	: select a suitable storage mechanism and process for records (physical or electronic) : check at least monthly that business records are being correctly categorised and stored	: demonstrate an appreciation of the importance of record keeping : show a willingness to ensure administrative tasks are undertaken correctly and timeously
Internal Competencies		
Financial Data Preparation		
Knowledge	Behaviour	Attitude
: know transactions affect the primary accounting categories (assets, liabilities, equity) and how to classify transactions : know the structure and purpose of the three primary accounting statements (income statement/balance sheet/cash flow statement) : know to record all business transactions : know that personal and business transactions must be separated : know the difference between cash and accrual-based accounting : know how to safeguard and account for business assets	: prepare (or have them prepared) management accounts monthly : select an appropriate tool for recording financial data (spreadsheet, accounting software, physical journals and ledgers) : review measures to safeguard and verify business assets, including petty cash, inventory	: show a willingness to devote business time and resources to the financial preparation function : demonstrate proper treatment of business assets (do not "borrow" from petty cash, take inventory for personal use)

Internal Competencies

Financial Data Analysis

Knowledge	Behaviour	Attitude
: know how to interpret a change in business financials from one period to the next	: review management accounts monthly	: confidence to compute and analyse numerical business measures
: know the difference between profits and cash	: compute elementary ratios monthly	: show a willingness to devote business time and resources to the financial analysis function
: know how to compute elementary business ratios using financial data (gross margin, net margin)	: assess the changes in business financials and ratios monthly	
: know how to assess the liquidity of the business		
: know the difference between variable expenses and fixed expenses (overheads)		
: know the cash collection cycle of the business		

Internal Competencies

Budgeting & Planning

Knowledge	Behaviour	Attitude
: know how to prepare a forecast of likely revenue and expenses	: review and compare budgeted revenue and expenses to actuals each month	: self-discipline to adhere to a budget and make the necessary changes to stay within self-imposed expense limits
: know that business assets need replacement	: review and compare budgeted inventory, debtors and creditors levels to actuals each month	: demonstrate an appreciation of the importance of setting and sticking to a budget
: know the amount of reserve cash to retain	: make the necessary operational and strategic changes when there is deviance between budget and actuals	: demonstrate pragmatism about potential business risks
: know how to estimate the cost of holding inventory at different levels	: review cash reserves relative to expenditure requirements each month	
: know how to assess and set payment terms for customers and suppliers	: assess potential risks to the business frequently and consider mitigation strategies	
: know how to assess primary risks to the business	: plan for the replacement of assets	

External Competencies

Revenue Generation

Knowledge	Behaviour	Attitude
: know the amount of revenue generation required after variable costs to cover fixed costs	: keep abreast of the macroeconomic environment in which the business operates	: demonstrate pragmatism about the length of the sales cycle or the cost of generating sales
: know how the macroeconomic environment might affect revenue generation (inflation, interest rates, exchange rates, economic growth)	: compute and review breakeven levels frequently	
: know how to establish a selling price for goods and services	: evaluate the sales mix and assess high margin and low margin items	
: know which goods or services are the critical drivers of revenue	: assess the actual cost and length of the sales cycle frequently	
: know the length of the business sales cycle	: review the competitive landscape frequently	
: know the actual cost to the business of generating sales		
: know the impact of increased or decreased sales on other business components		
: know about competitor or substitute goods and services		

External Competencies

Engaging with Financial Service Providers & Investors

Knowledge	Behaviour	Attitude
: know that FSPs will charge fees for their services	: evaluate the costs and benefits of financial services before making a decision	: demonstrate a willingness to review the details of the contractual relationship with FSPs and investors
: know the financial impact of equity versus debt financing	: communicate with equity and debt participants regularly	
: know the difference between the obligations to equity participants versus debt participants	: review and evaluate any contractual relationships with FSPs and investors frequently	
: know about the liability and obligations associated with collateral and suretyship		
: know about the various types of insurance appropriate for the business		

External Competencies

Engaging with Regulators & Regulations

Knowledge	Behaviour	Attitude
: know that there are legal consequences for non-compliance with regulations	: establish proper contracts for temporary and permanent staff	: demonstrate a willingness to comply with the regulatory environment
: know that tax regulations require compliance	: submit and file tax returns timeously	
: know that labour laws require compliance	: ensure AFS are appropriately prepared and filed	
: know that regulations regarding consumer rights require compliance	: stay abreast of any regulatory changes that may affect the business	

3.5.6 Implementing Bloom's Revised Taxonomy

The skill levels overlaid on the two-dimensional Bloom's Revised Taxonomy table allow for the formulation of survey instrument items suitable to test the knowledge, behaviour and attitude at an appropriate complexity for different enterprise status levels.

Referring to Figure 3-5 and Figure 3-6, researchers can devise items that test the factual and conceptual knowledge at lower cognitive process levels (remember, understand, apply) of the "budgeting and planning" topic for sole traders. Alternatively, researchers can formulate items to test procedural and metacognitive knowledge at higher cognitive process levels (analyse, evaluate, create) under the topic "engaging with regulators and regulations" for small and medium enterprises.

Using this methodological basis for item formulation could allow for the development of different item phrasing and complexity, dependent on the respondent's enterprise status (size). Given that the study proposes that all enterprises have advanced skills in two topics, namely, record keeping and revenue generation, items developed for those topics would be mutual to all respondents. For this work, the decision was taken to centre the item formulation and associated skill levels on the microbusiness enterprise status; in other words, those businesses with a maximum of ten employees.

It is proposed that microbusiness respondents require advanced skills in record keeping and revenue generation topics (as do all enterprises); standard skills in financial data preparation and financial data analysis; basic skills in budgeting and planning, engaging with FSPs, engaging with regulators and regulations.

Therefore, if this test instrument, designed for microbusiness respondents, is administered to sole traders, the items under the topic financial data analysis may test the respondents' knowledge, behaviour and attitude at a higher skills level than proposed. Equally, a survey item designed for microbusiness entrepreneurs administered to small business respondents may test their business financial literacy in the topics of financial data preparation, budgeting and planning, engaging with FSPs, engaging with regulators and regulations at too low a level.

Rather than creating multiple versions of the test instrument that would require the dynamic alteration of the items displayed depending on the respondents' indication of enterprise status, the study created one microbusiness-specific version and interpreted the results obtained by non-microbusiness respondents accordingly.

Chapter 4 sets out the survey instrument construction considerations and proposed construction methodology.

Chapter 4 Test Instrument Design & Development

4.1 Introduction

This work's intended outcome and research goal are to produce a robust and validated survey instrument that enables testing the functional business financial literacy levels of entrepreneurs and SMME owners and managers, with a specific focus on microbusinesses (less than ten employees). As is set out in Section 3.5.2, this study defines functional business financial literacy as:

> *The combination of knowledge, behaviour and attitude competencies that a current or potential entrepreneur should have to make effective operational and strategic financial business decisions for the current and future operating environment.*

To incorporate the three dimensions indicated in the conceptual model proposed in Section 3.5.3, items (questions) that gather information related to all three dimensions across the seven topics need to be formulated. At first glance, the construction of a survey instrument might appear to be a relatively straightforward task. However, it is an involved and multi-faceted process that requires both qualitative and quantitative input.

A survey instrument comprises two high-level components: the items that arise from the framework, and the demographic information gathering, allowing for a more in-depth interrogation and analysis of the respondent data.

Another essential step in the design and development of a survey instrument is determining the instrument's reliability and validity.

4.2 Demographic Information Gathering

Most survey instruments contain a demographic information gathering component, and typically these demographic detail questions are the first section of a survey. Some surveys may have inclusion or exclusion criteria embedded within the demographic data, mainly when targeting a demographic subgroup. This survey instrument intended to capture some demographic information to better understand and segment the survey results but also included or excluded responses based on the respondent's personal demographic data.

To confirm the collection of demographic data in adherence to ethical standards and to ensure the highest level of demographic information accuracy, the phrasing of the questions eliciting the respondent's age, gender and population group was undertaken with care.

4.2.1 Age

The respondent's age is the primary data input to capturing the demographic profile, and in most survey instruments and opinion polls, the respondent age is the most frequently asked question. However, asking both "how old are you?" or "what is the date of your birth?" in a survey instrument can elicit inconsistent data (Payne, 1951). The other often-used questions to determine the respondent age include a further open-ended variant, "what is your age?" and the closed-ended requirement for respondents to select the relevant age category from a pre-filled list. Peterson (1984) found that asking the respondent's age resulted in the highest refusal rate while requiring a categorical response resulted in the highest inaccuracy of response. Thus, requiring the respondent to input a birth date is likely the question format that will minimise errors in this information by minimising refusal and targeting accurate information.

4.2.2 Gender

The Gender Identity in US Surveillance Group (GenIUSS) published a report coordinated by the Williams Institute of the UCLA Law School, providing recommendations on best practices for gathering gender status data within survey instruments. The Group recommended a two-step approach to population-based surveys that gather gender information. The two steps involve asking a question about the sex assigned at birth and a second question about the current gender identity of the respondent (The GenIUSS Group, 2014). As this study intends to gather gender as perfunctory demographic information, the GenIUSS suggested phrasing to gather information on the current gender identity of the respondent was adopted within the survey instrument. The phrasing of the gender identity question was: "How do you describe yourself?" with potential respondent answers of male, female, transgender, I do not identify as male, female or transgender.

4.2.3 Population Group

The administration of the survey instrument will, for this study, be within the geographic borders of South Africa. Statistics South Africa uses four population group classifications when gathering and publishing census data. The 2019 mid-year population estimate report uses Black African, Coloured, Indian/Asian, and White to gather population group or racial profile information (Statistics South Africa, 2019a). The survey instrument adopted the population group classification used by Statistics South Africa.

4.3 Instrument Item Formulation

4.3.1 Financial Knowledge Items

This study proposes that the financial knowledge items included in the functional business financial literacy survey instrument follow two item formats: multiple-choice questions (MCQs) and a variant of MCQs in the form of True/False questions. MCQs consist of a stem that presents the question and a range of plausible but incorrect answers and the correct answer, from which the respondent must select. The incorrect answers are known as distractors, while the correct answer is known as the key.

Haladyna and Downing (1989) created a taxonomy of 43 MCQ item writing rules by evaluating the results of 96 theoretical and empirical studies in the literature focused on educational measurement. Each rule's evaluation used item difficulty, item discrimination, test reliability, and test validity as a framework.

One of the most frequently tested elements in the formulation of MCQs is analysing the ideal number of distractor items to use. A higher number of distractor items (three or four distractors) appear to increase the test instrument's item validity and reliability. However, the critical feature is the distractors' quality rather than the quantity or the number of distractors. Ascalon et al. (2007) evaluated both the item stem format and the distractor set's homogeneity. When the distractors were written similarly to the correct answer (key) and were plausible, respondents answered more items incorrectly. A higher number of incorrect answers from survey responses implies that the survey questions are more complicated to answer. The classification of distractors is as functional or non-functional distractors. If more than five per cent of the respondents select a particular distractor, then it is deemed functional (Tenzin, Dorji and Tenzin (2017), DiBattista and Kurzawa (2011), Mahjabeen et al. (2017)). Haladyna and Downing (1989) propose developing as many functional distractors as is feasible. Implementation of the following guidelines to ensure the formulation of functional distractors includes:

- *Keeping options similar length*
- *Avoidance of grammatical clues*
- *Use conventional or plausible errors*
- *Avoidance of complex Type K items (for example, the inclusion of a "both a & b" option or similar)*

A distractor sometimes used in MCQ formulation is the "all of the above" or "none of the above" respondent option. The inclusion of "all/none of the above" tends to decrease item discrimination and test reliability (Downing & Haladyna, 1997). In the preliminary stages of item formulation

within the test instrument's financial knowledge dimension, the use of "all/none of the above" was avoided, but a "not sure" option was included. While this may appear similar to "all/none of the above", the "not sure" inclusion tends to encourage respondents not to guess when they feel uncertain which of the answer set is the key. There has not been extensive testing of the inclusion of a non-guess option in prior literature; however, some evidence suggests that respondents do not often select this option (DiBattista & Kurzawa, 2011).

A further preliminary decision taken regarding distractor number was to include four distractors for the standard MCQ items. One of the distractors was the "not sure" option, requiring the creation of an additional three distractors and the key per item. The True/False variant of the MCQs has three potential response options, namely, "true", "false", and "not sure".

In addition to ensuring the formulation of functional distractors, close attention was paid to the item stem's formulation. MCQ item stem formulation and creation followed the guidelines adapted from Hansen and Dexter (1997):

- Use of a single problem per stem linked to the financial competency topic and skill level
- The phrasing of the stem as a question rather than as a complete sentence for standard MCQs, excluding True/False questions
- Phrasing the stem of True/False questions as a statement
- Adoption of the Flesch Kincaid Reading Ease formula to ensure the stem text does not breach a high school functional reading level (see Section 4.4.2.1)
- If negatives are used in the stem, highlighting the negative word using a bold or italicised font

Hansen and Dexter (1997) investigated the need to adopt guidelines to formulate MCQ items and ensure those items are reviewed multiple times to eradicate potential errors. They evaluated auditing and accounting MCQs provided by textbook publishers against questions prepared for the Certified Public Accountant (CPA) exam. They found significantly fewer violations as measured by 17 assessment criteria in CPA MCQs versus test bank questions made available by textbook publishers. They proposed that the CPA questions were less prone to error as the individuals tasked with preparing the CPA questions received training in the preparation of questions and that the CPA questions underwent extensive review before usage.

4.3.2 Financial Behaviour and Financial Attitude Items

Questions or items assessing a respondent's level of financial knowledge have a clear correct or incorrect outcome. The respondent either knows or they do not. However, when assessing behaviours or attitudes, there is not necessarily an obvious correct answer. Likert-scaled

question items most commonly gather respondent behaviour and attitude responses. A Likert scale presents a series of statements that express a range of sentiments about the underlying construct from strongly positive to strongly negative (Carifio & Perla, 2007).

The use of rating scales to gather behavioural and attitudinal information is not a new methodology. Likert (1932), after whom scaled data is named, is the psychologist credited for developing the 5-point scale. Champney and Marshall (1939) provided an early critique of rating scale data collection. They hypothesised that the increase in scale points increased the item's reliability until a point where the increase in random error outweighed the ability to discriminate between responses.

Rating scales may capture the degree of frequency, agreement, importance, quality, likelihood, value, relevance, or other respondent measures. The response could present as a dichotomous response (yes or no), or a trichotomous scale (yes, no or maybe) or using a scale with a varying number of response points.

A rating scale is a form of communication between researcher and respondent, and Royal et al. (2010) emphasised that communication validity, described as the extent to which the survey is unambiguous in language and meaning, is critical. Respondents need to distinguish between the rating categories accurately and rely on the label categories to do so. The stylistic presentations of the scale categories can influence the selection by the respondent. There is a tendency to assume the middle position means typical, and respondents may see this as an opportunity to opt-out from an opinionated (directional) answer with a neutral answer.

Labelling of the categories can also impact the tendency of respondents to answer with a directional bias. These biases are Net Acquiescence Response Style (NARS) (also known as acquiescence bias), in which there is a greater tendency to agree, and Extreme Response Style (ERS), which is the tendency to excessively select the extreme response categories at the ends of the rating scale. A further bias is a Misresponse (MR) to reversed items. Presentation of reversed items is opposite to a non-reversed counterpart, but respondents respond in the same category direction despite the opposite meaning (Weijters, Cabooter & Schillewaert, 2010).

Weijters, Cabooter and Schillewaert (2010) sought to test the biases on a scale survey contrasting the labelling of all categories against the labelling of only the extreme categories and the inclusion (or not) of a neutral mid-point. They found that labelling all categories lead to a higher NARS bias but lower ERS and MR. The inclusion of a mid-point also increased the NARS bias and decreased ERS and MR. They suggest that if the research intends to conduct quantitative analysis on the results, including SEM and other models, a 5-point scale with only the end-points labelled may be the most appropriate scale format.

Zhang and Savalei (2016) proposed an alternative methodology for minimising NARS or acquiescence bias. They suggested converting Likert items to an expanded format, replacing each response category with a complete sentence. They suggested that this expanded format forces respondents to be more attentive and to observe the differences between the options better, reducing NARS and MR.

In addition to research on the presentation and phrasing of scale labels, many researchers have sought to determine the optimum number of scale points. Xu and Leung (2018) suggested that prior findings from empirical research indicated that the number of points on the scale should fall between four and seven. They conducted a study to investigate the properties of a commonly used psychometric test, the Rosenberg Self-Esteem Scale, under varying numbers of Likert points. They found the latent traits measured by the scale were not affected by varying the number of scale points, although they suggested a 7-point scale (or higher) increases the reliability of the measurement.

The number of scale points selected for inclusion by the researcher depends practically on the survey administration. If a survey administrator has to read out the point options for a telephonically administered survey, the scale becomes impractical to administer beyond a 5-point or perhaps 7-point scale (Dawes, 2008).

Dawes (2008) highlighted that statistical techniques, including confirmatory factor analysis (CFA) and structural equation modelling (SEM), are often applied to survey data. Both those tools are sensitive to the statistical characteristics of the data (mean, standard deviation, skew, kurtosis), and thus, if the number of scale points impacts those characteristics, this may alter the output from CFA or SEM. However, he found sufficient equivalence between 5-point, 7-point and 10-point scales that the data are comparable.

A material criticism of the use of Likert scales is that they are ordinal; while the responses have a rank order, researchers cannot know with certainty that the differences expressed between the scale categories are equal (Norman, 2010). On the basis that the data are ordinal, statisticians would argue that parametric statistical methods cannot be applied. Norman (2010) believes that despite the ordinal nature of Likert scale data, parametric statistics are appropriate (even though questioning the statistical rigour) as it is unlikely the researcher will reach the wrong conclusions. Carifio and Perla (2007) point to work conducted by Glass, Peckham and Sanders (1972), who showed that when conducting Analysis of Variance (ANOVA), the F-test statistic is robust and unbiased when applied to data collected using 5-point or 7-point Likert scales. Carifio and Perla (2007) also commented that the mitigation of statistical concerns was achievable if researchers analyse Likert responses as a composite across the survey and not on an item-by-item basis.

Boone, Staver and Yale (2014) suggested that a mechanism to deal with ordinal data was one of the principal benefits of using Rasch analysis. They suggested utilising Rasch measurement in all instances where pooled survey items indicated respondent survey performance.

4.4 Test Instrument Reliability and Validity

Regardless of the nature of the survey, any survey test instrument should undergo a process of reliability and validity testing before implementation as part of the instrument development process. However, most financial literacy test instruments historically circulated fail to indicate the methodology followed to ensure reliability and validity. For example, the previously discussed 2003 survey of Washington State residents' financial literacy used a rigorous sampling methodology, but there is no mention of the application of the same rigour to the formulation of the survey questions. Similarly, Lucey (2005) expressed concern that while the survey questions of the Jump$tart Survey represent indicators of financial knowledge, the measures were not statistically validated.

Specific techniques in the determination of instrument reliability and validity are incorporated into the instrument design process, while other more quantitative techniques rely upon the instrument's empirical data in order to undertake the computation.

This section introduces the concepts of reliability and validity. Some reliability and validity concepts were incorporated into the design and development of the survey. Those computations that are reliant on survey data were undertaken after survey administration, and those results are presented in Chapter 6.

4.4.1 Instrument Reliability

Survey instruments, irrespective of the survey objective or respondent sample, should adhere to stability, equivalence and internal consistency as measures of reliability (Cronbach, 1951; OECD, 2009a; Sijtsma, 2009; Vaske, Beaman & Sponarski, 2017; Taber, 2018). In an instrument that demonstrates stability, respondents will give the same answer to the same question when asked at different points in time, assuming no material changes have taken place that might elicit a different response. Usage of a test-retest procedure, in which the same respondents undertake the same test under the same conditions, can verify instrument stability. Typically, a correlation coefficient between survey results greater than 0.7 (Hundleby & Nunnally, 1968; Bland & Altman, 1997; Taber, 2018) is required to confirm stability. The criticism of a test-retest approach is that respondents may remember the survey item answers, and thus, it is a measure of memory effects rather than an accurate measure of instrument stability.

Surveys are often undertaken by different survey data gathers, particularly for extensive national surveys administered telephonically or by an in-person interview. If the data collection group varies, this can introduce a requirement for equivalence, the need for the same survey instrument to generate the same answers at a point in time irrespective of the data gatherer (Aday & Cornelius, 2006). It is possible to test and determine a measure of equivalence using parallel or alternative form instruments. A parallel form instrument requires two different survey instruments administered to either the same or alternative respondent groups. In practice, researchers seldom undertake parallel form testing as it is challenging to ensure that two instruments are indeed identical (Bolarinwa, 2015).

An alternative form approach to equivalence testing might be to change a specific item's wording to verify that a differently worded question measures the same attribute. In Lusardi and Mitchell's 2007 study using the Rand American Life Panel (ALP) dataset, the wording in three questions was reversed and using two randomly chosen groups, the impact of this change was assessed in order to mitigate the likelihood of respondents guessing the correct answers rather than understanding the question. One of the questions gave results that appeared to be unaffected by the question's word order, but the other two questions demonstrated a difference in survey responses. The authors suggested that these results indicated that some respondents might be guessing rather than presenting actual financial knowledge. These findings introduce potential errors in the measurement of financial knowledge (Lusardi & Mitchell, 2007).

Variations in internal consistency can also occur if questions intending to test the same underlying concept, or questions thought to be equivalent, demonstrate that they are not equivalent. A commonly used approach to determining a measure of internal consistency across a survey instrument, particularly on ordinal or scale data, is the use of Cronbach's alpha (Cronbach, 1951; OECD, 2009a; Sijtsma, 2009; Vaske, Beaman & Sponarski, 2017; Taber, 2018). This metric provides a measure of coefficient reliability or consistency.

$$\alpha = \frac{N\bar{c}}{\bar{v} + (N-1)\bar{c}} \qquad \textbf{(4-1)}$$

Where: $N = the\ number\ of\ items$

$\bar{c} = the\ average\ inter - item\ covariance$

$\bar{v} = the\ average\ variance$

In one of the earlier financial literacy survey instruments, Chen and Volpe (1998) demonstrated good practice in their survey design using a pilot study and expert input in the construction

process. These researchers further assessed the quality and consistency of the survey instrument using Cronbach's alpha.

In the interpretation of Cronbach's alpha, it needs to be considered that scores tend to rise with an increase in the number of instrument questions, the inter-item covariance, and dimensionality. Researchers consider an alpha of 0.65-0.80 to be sufficient to verify internal consistency but should also include the presentation of the number of items for better context and interpretation (Vaske, Beaman & Sponarski, 2017).

Thus, survey instruments that are longer and contain more question items, will show higher reliability scores as measured by Cronbach's alpha. When examining the content validity of the Jump$tart Survey, Lucey (2005) suggests that while there were survey items in each of the four content areas (income, money management, savings and investment, spending and credit), the number of items was insufficient to cover all content. Additionally, he found a potential social bias suggesting that many of the items failed to account for the contexts of all students or consider that students receive differing levels of exposure to the tested topics (Lucey, 2005). The Jump$tart Coalition survey suffers from potential reliability and validity challenges despite comprising more than 30 questions. The reliability and validity concerns identified in the Jump$tart survey raise immediate questions about the reliability and validity of the Big Three[9].

Huston (2010) suggests that three to five items per content area are the minimum required to ensure adequate representation per content area. Thus, the three items of the Big Three would appear insufficient. In work to assess the validity of the personal financial literacy instruments in use, Rieger (2020) found that as some of the instruments were made up of few items, like the Big Three, a Cronbach's alpha value of 0.4 could be considered acceptable. However, Germany and Austria chose not to participate in the PISA adolescent financial literacy assessment as the project coordinators in those countries felt that there was insufficient development of the current version of the financial literacy test. Thus the reliability of the findings was in question (Schuhen & Schürkmann, 2014).

4.4.2 Instrument Validity

In addition to considerations about survey instrument reliability, instruments must also satisfy the conditions of validity. An instrument's validity is a measure of the degree of systematic differences obtained between the question responses and the intended question concept. There are various validity measures: content validity, criterion validity, and construct validity (Bolarinwa, 2015).

[9] The ubiquitous three personal financial literacy survey questions.

4.4.2.1 Content Validity

A form of validity testing to address face validity, which is a component of content validity, can be implemented in the early stages of the survey instrument design process. The assessment of face validity is typically done by canvassing the input of a panel of expert individuals who judge the survey instrument's appearance in terms of clarity and readability and the representativeness of the proposed questions (Burton & Mazerolle, 2011). The expert group can rate each question using a dichotomous or continuous Likert-style scale which enables conversion of these expert input results to indices. The indices include an item-rated content validity index (I-CVI) which can then be assessed and also used for the formulation of a scale-level content validity index (S-CVI) to represent the level of agreement between the expert respondents (Bolarinwa, 2015). A part of the face validity process could include an evaluation of the readability of the survey items. Computation of the survey items' readability is possible using methodologies, including the Flesch Kincaid Reading Ease and the Gunning-Fog Index. Both of these two readability methods were formulated in the 1940s (Flesch, 1948; Gunning, 1969) but remain prevalent in the modern era, with Van Oosten, Tanghe and Hoste (2010) finding a strong correlation between the two measures. The present study used the Flesch Kincaid Reading Ease score as a guideline within the item formulation process. Calculation of the Flesch Kincaid Reading Ease score is as follows:

$$\begin{aligned} &Flesch\ Kincaid\ Reading\ Ease \\ &= 206.835 - 1.015\ x\ (words\ per\ sentence) \\ &- 84.6\ x\ (syllables\ per\ word) \end{aligned} \qquad \textbf{(4-2)}$$

A Flesch Kincaid Reading Ease score falls between 0 and 100, with higher scores suggesting that text is easier to read. A score greater than 50 implies that high school students would have the ability to read the text with comprehension (Flesch, 1948).

In the origination of a new financial literacy test instrument to assess older respondents' financial literacy levels (over 60 years), Finke, Howe and Huston (2016) initially tested 89 potential questions. They used an eight-member expert panel to make recommendations, and together with the results of validity and reliability tests, selected only 20 questions for the final instrument.

Similarly, in addition to using colleagues and fellow researchers to confirm their proposed instrument's face validity, Schwella and van Nieuwenhuyzen (2014) also had the expert group review the pilot survey responses for suitability.

This study uses an expert group to provide content and construct validity, the details of which are addressed in Section 5.4.

A degree of content validity can also stem from the reuse of questions included in previous surveys. However, this would seem to introduce a risk of the perpetuation of potentially flawed questions.

4.4.2.2 Criterion Validity

Criterion validity is segmented into two types, namely predictive validity and concurrent validity. Criterion validity measures the correlation of survey responses with some future predicted action or behaviour carried out by the respondent (predictive validity), or an action or behaviour carried out at the same time as the survey measurement (concurrent validity) (Hundleby & Nunnally, 1968; Carmines & Zeller, 1979; Knoll & Houts, 2012; Bolarinwa, 2015).

The establishment of criterion validity is essential when the survey instrument results estimate future behaviour on the respondent's part. This study does not use the functional business financial literacy measurement as a predictive tool for concurrent or future behaviours because the instrument itself is intended to be anonymous, which means the researcher cannot follow up with respondents later. (See ethical considerations in Section 5.3) However, future work that evaluates the business' performance after establishing a functional business financial literacy score would be valuable.

Carmines and Zeller (1979) emphasise that, practically, criterion validity depends on the selection and measurement of the criterion as much as it depends on the survey instrument's quality. Thus, while the ability to link functional financial literacy levels to business success is appealing (and would require a named rather than anonymous instrument), the task of determining what constitutes business success as a criterion measure would likely be a challenging process.

4.4.2.3 Construct Validity

Construct validity evaluates the relationship between conceptual theory and empirical evidence rather than against some external criterion (Bolarinwa, 2015). The evaluation of this relationship typically involves three steps: the specification of the theoretical relationship, an examination of the empirical relationship between the concept measures, and an interpretation of the empirical evidence (Carmines & Zeller, 1979).

The validity of the conceptual model proposed by Kempson, Collard and Moore (2005) to form the basis of their UK financial capability survey included the input of expert individuals canvassed at a seminar and then the use of focus groups to gather the input of the intended survey respondents and validate their conceptual model. Schuhen and Schürkmann (2014) undertook a

quantitative validation of the theoretical construct using Rasch-modelled values and verified them within structural equation models (SEM).

Factor analysis is a further quantitative technique used to evaluate the relationship between subsets of variables (survey question answers) in such a way that supports the view that they examine the same concept.

4.4.3 Introduction to Factor Analysis

Factor analysis is a data reduction methodology in which researchers seek to find a smaller number of latent or unobservable variables representing the observed variables. Factor analysis tends to be either exploratory or confirmatory, resulting in two types of factor analysis. Exploratory factor analysis (EFA), as the name suggests, attempts to explore or determine the underlying structure, while confirmatory factor analysis (CFA) is a verification exercise to confirm a defined structure (UCLA: Statistical Consulting Group, 2016).

As testing the financial literacy levels of young Germans was not undertaken as part of the OECD PISA survey due to concerns about reliability and validity, Förster, Happ and Molerov (2017) undertook to translate and adapt an American Test of Financial Literacy (TFL) in order to measure the financial literacy levels amongst German young people. They made use of CFA to verify the unidimensionality of their model. Ensuring that survey question items are unidimensional is the methodological step undertaken after collecting instrument results. If a question item is unidimensional, it adds to the understanding of only one rather than multiple survey constructs. A review of the inter-item correlations can determine whether the individual items contribute something unique (moderate level of correlation between 0.3 and 0.6) to a particular construct. CFA can test the constructs themselves for unidimensionality. Schuhen and Schürkmann (2014) similarly used CFA to test the financial literacy construct with SEM.

An alternative methodology for testing a construct is the use of EFA. Researchers undertake EFA using a variety of approaches, dependent on the study objectives. Extraction methods include principal component analysis (PCA), principal axis factoring (PAF) and maximum likelihood (ML). Factor rotation methods could include orthogonal or oblique rotation after determining the independence (or not) between factors.

The OECD PISA study, in their technical report for the assessment of international student scores, makes use of EFA using a Promax rotation (allows for correlation between factors: oblique) and then a two-dimensional CFA (OECD, 2009b). Okello et al. (2017), in their assessment of how access to finance results in growth among developing country SMEs, assessed their construct validity using EFA and used a varimax rotation (assumes factors are not correlated, which is referred to as orthogonal).

4.4.4 Item Discrimination and Difficulty

Item discrimination and difficulty are typically analysed using one of two methodologies: Classical Test Theory (CTT) or Item Response Theory (IRT). CTT tends to be the more computationally straightforward methodology and assumes that the observed score (test score) is the respondent's true score plus an unobservable range or test error. CTT assumes that the test error distribution is consistent for all respondents and uses the standard deviation of errors to measure the test error (Magno, 2009). The frequency of correct responses measures true score as an indication of item difficulty and instrument reliability. The item-total correlation evaluates item discrimination (Magno, 2009, Kunovskaya, Cude and Alexeev, 2014).

However, as discussed in Section 2.4, using an IRT methodology suggests the probability of a respondent answering a question item with the correct answer depends on the respondent's underlying aptitude or trait and the difficulty of the item. Expression of the item difficulty can be relative to the aptitude or trait of the respondent. If an item has a difficulty score of zero, the mean or average level of difficulty, then a respondent with an average aptitude will have an equal probability of answering the item correctly or incorrectly (the point of median probability).

In an IRT analysis, item discrimination indicates the extent to which a correct answer on an item corresponds to success across the whole test. Higher positive discrimination values indicate greater consistency between the item and the respondent's underlying trait or aptitude. Within a 1PL model, the item discrimination is assumed to be the same for all items, and just the difficulty parameter varies across items. A 2PL model presents an item difficulty and item discrimination parameter for each item individually.

Förster, Happ and Molerov (2017) presented data on both the item discrimination of the financial literacy survey adapted from the American version and item difficulty. They indicated the IRT parameters with low or negative values indicating an easy question and higher values indicative of more difficult questions.

As indicated in Section 2.4.2.2, the OECD PISA study uses the most uncomplex IRT form, the Rasch one-parameter logistic model (1PL) (OECD, 2009a). To include the respondent's underlying trait or aptitude and the item difficulty and item discrimination, a two-parameter logistic model (2PL) is required.

Boone, Staver and Yale (2014) emphasise that while a Rasch model might look mathematically equivalent to an IRT one-parameter model (1PL), there is a philosophical difference. A Rasch approach does not alter the model to fit the data, while an IRT 1PL approach and the extended 2PL and 3PL methodologies alter the model to fit the inputted dataset.

Specialist statistical software is required to conduct Rasch or IRT modelling to determine the respondent's underlying trait, the item difficulty, and the item discrimination. The determination of these measures is an iterative process refining the initial estimates until reaching a prespecified criterion. The conditional maximum likelihood approach, to determine the trait and difficulty estimates, was used by Schuhen and Schürkmann (2014), followed by a verification of the Rasch-models using a Wald test and the likelihood-ratio-test.

4.5 Development of the Functional Business Financial Literacy Instrument

Using the financial competencies framework presented in Section 3.4.7and the associated skills levels presented in Section 3.4.6, survey items were created to indicate competencies across the three dimensions of functional business financial literacy, as defined and conceptualised in Sections 3.5.2 and 3.5.3. The functional business financial literacy best practises table from Section 3.5.5 forms the underlying content to answer the educational knowledge question, "what should they know?" The best practices table also shapes the behavioural question, "what do they do," as well as the attitude question, "what should they feel?"

Section 4.3 provides guidelines in the formulation of content items for the various functional business financial literacy dimensions to apply in the item creation process, and Section 4.4 introduces the concepts about test reliability and validity.

Several versions or iterations of the functional business financial literacy survey instrument were anticipated. Version 1 of the instrument represented the first attempt to construct a valid and reliable instrument to measure entrepreneurs' functional business financial literacy.

4.5.1 Functional Business Financial Literacy Instrument: Version 1

The survey instrument below represents version 1 of the formulated survey items and includes the Flesch Kincaid Reading Ease Score and the financial literacy dimension (knowledge, behaviour, attitude), where appropriate. Where possible and appropriate, visual information was provided together with the question text. The intention was to present the respondents with financial data in a format they may be most used to seeing, rather than perhaps misevaluating financial literacy in favour of other competencies around data processing and numeracy. For example, item 9 shows a representation of an invoice and item 18 displays the sample of a cash flow statement.

The formulation of the question text wording was an iterative process to generate text that met the self-imposed reading ease criteria. As discussed in Section 4.4.2.1, a Flesch Kincaid Reading Ease Score above 50 suggests that respondents with a high-school level of education would be

able to read the text with understanding and comprehension. The text wording, together with the key and distractors, was formatted to exceed a minimum Flesch Kincaid Reading Ease Score of 50, which it was hoped would mitigate incorrect answers resulting from a lack of understanding rather than a lack of financial competency.

However, item 4 does not comply with a minimum reading ease score of 50. This item is a descriptive question to test the level of education by the respondent, and it was found to be impossible to formulate this question and answer item to meet the self-imposed criteria. The question text by itself ("What is the highest level of education that you have completed?") returns a Flesch Kincaid Reading Ease Score of 52.9, but the inclusion of the statements describing the levels of education lowers the score substantially.

Table 4-1: Functional Financial Literacy Instrument Version 1

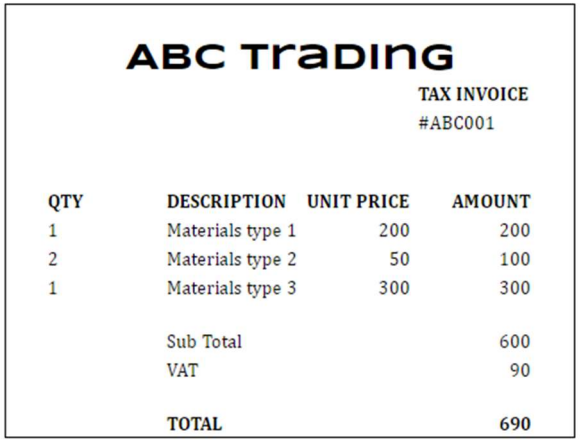
Section A: About You

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
1	How do you describe yourself? ▪ *Male* ▪ *Female* ▪ *Transgender* ▪ *I do not identify as male, female or transgender* ▪ *I would prefer not to answer*	68.7	n/a
2	What is your date of birth?	116.1	n/a
3	Which population group best describes you? ▪ *Black African* ▪ *Coloured* ▪ *Indian/Asian* ▪ *White* ▪ *I would prefer not to answer*	61.1	n/a
4	What is the highest level of education you have completed? ▪ *I have not completed high school* ▪ *I have completed high school (Grade 12)* ▪ *Industry qualification, trade certificate or diploma* ▪ *Undergraduate degree* ▪ *Postgraduate degree*	33.9*	n/a

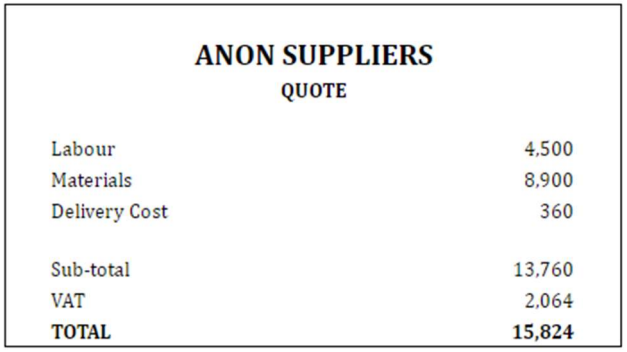
Section B: About Your Business

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
5	In what year did your business start operating?	61.2	n/a
6	Which statement best describes what your business does most of the time? ▪ *My business sells goods* ▪ *My business provides services* ▪ *My business sells goods and provides services*	70.4	n/a
7	Which statement best describes your role in the business? Please check all that apply. ▪ *I own all or part of the business* ▪ *I am involved in making financial decisions for the business* ▪ *I am involved in the daily business operations* ▪ *None of the above statements describes my role*	60.7	n/a
8	How many people work in your business every day? If you make use of freelancers or other contract staff, count the typical number of freelancers or contract staff working each day. ▪ *I am the only one* ▪ *10 or less including me* ▪ *50 or less including me* ▪ *250 or less including me* ▪ *More than 250 including me*	65.5	n/a

Section C: Record Keeping

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
9	You own a business called ABC Trading. Which transaction has occurred if you have the following business document?  ABC TRADING TAX INVOICE #ABC001 QTY DESCRIPTION UNIT PRICE AMOUNT 1 Materials type 1 200 200 2 Materials type 2 50 100 1 Materials type 3 300 300 Sub Total 600 VAT 90 TOTAL 690 ▪ *A customer has bought goods from you* ▪ *A supplier has sold goods to you* ▪ *A customer has paid you* ▪ *A supplier has paid you* ▪ *Not sure*	71.1	Knowledge
10	Business documents must be kept in paper form. ▪ *True* ▪ *False* ▪ *Not sure*	80.8	Knowledge

Section C: Record Keeping

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
11	How often do you personally check that your business documents are stored and saved correctly? ▪ *Each year* ▪ *Each quarter* ▪ *Each month* ▪ *Each week* ▪ *I don't check*	76.5	Behaviour
12	You have this document from a supplier. Your business is registered for VAT. You can use this document to claim R2,064 in VAT.  ▪ *True* ▪ *False* ▪ *Not sure*	84.3	Knowledge

ANON SUPPLIERS
QUOTE

Labour	4,500
Materials	8,900
Delivery Cost	360
Sub-total	13,760
VAT	2,064
TOTAL	**15,824**

Section C: Record Keeping

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
13	Assess the statement. Making sure your business documents are stored and saved correctly is critical to the success of your business. ▪ *Strongly Disagree* ▪ *Strongly Agree*	51.1	Attitude

Section D: Financial Data Preparation

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
14	How often do you review your business finances? ▪ *Each year* ▪ *Each quarter* ▪ *Each month* ▪ *Each week* ▪ *I don't review*	85.4	Behaviour
15	The income statement shows which of the following? ▪ *Assets and liabilities* ▪ *Income and expenses* ▪ *Receipts and payments* ▪ *Equity and cash balance* ▪ *Not sure*	50.6	Knowledge

Section D: Financial Data Preparation

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
16	A bank transaction fee of R0.83 should be recorded as part of your business accounts. ▪ *True* ▪ *False* ▪ *Not sure*	88.7	Knowledge
17	How often do you borrow money from the business petty cash to pay for personal expenses? ▪ *Never* ▪ *Always*	61.3	Behaviour
18	The following is a sample of a business cash flow statement. What is the net cash flow for the business? **CASH FLOW STATEMENT FOR THE YEAR ENDED** **Cash from Operations** Cash received from customers 35,000 Cash paid to suppliers 55,000 **Cash from Financing** Loan proceeds received 15,000 **Cash from Investing** Disposal of machinery 5,000 ▪ *110,000* ▪ *0* ▪ *-15,000* ▪ *30,000* ▪ *Not sure*	88.3	Knowledge

Section E: Financial Data Analysis

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
19	Assess the statement. I am confident that I have the skills needed to analyse my business finances. ▪ *Strongly Disagree* ▪ *Strongly Agree*	56.0	Attitude
20	Make use of the information below. Calculate the gross profit margin. Sales 10,000 Cost of sales 4,500 ▪ *45%* ▪ *10%* ▪ *55%* ▪ *100%* ▪ *Not sure*	55.1	Knowledge
21	It is possible for your business to make profits but run out of cash. ▪ *True* ▪ *False* ▪ *Not sure*	77.8	Knowledge

Section F: Budgeting and Planning

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
22	How often do you think about what your business would do if it ran out of cash? ▪ *Never* ▪ *Always*	85.1	Behaviour
23	A new machine costs R50,000 and can be used for 5 years after which it is no longer usable. The machine allows your business to make cash profits of R7,000 per year. Buying the machine is a good business decision. ▪ *True* ▪ *False* ▪ *Not sure*	75.8	Knowledge
24	Assess the statement. It is okay for your business to spend more than budgeted on expenses. ▪ *Never* ▪ *Always*	61.2	Attitude

Section G: Generating Revenue

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
25	To increase the gross margin of your business, what step can you take? ▪ *Increase the number of products sold* ▪ *Reduce the number of products sold* ▪ *Increase the selling price of the products sold* ▪ *Reduce the selling price of products sold* ▪ *Not sure*	83.0	Knowledge
26	Do you include your time cost when estimating what it costs your business to generate revenue? ▪ *Never* ▪ *Always*	53.1	Behaviour
27	Using the financial data below: how many items do you need to sell each month to pay for your monthly overheads? Selling Price per Item 100 Cost per Item 50 Monthly Overheads 2,000 ▪ *25 items* ▪ *40 items* ▪ *50 items* ▪ *100 items* ▪ *Not sure*	60.6	Knowledge

Section G: Generating Revenue

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
28	Your business sells goods and services to an overseas market, and your local currency strengthens. Your local currency revenue will increase. ▪ *True* ▪ *False* ▪ *Not sure*	51.1	Knowledge
29	Your business functions within a bigger market. How often do you read, watch or listen to information about that market? ▪ *Never* ▪ *Always*	57.1	Behaviour

Section H: Engaging with Financial Service Providers

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
30	When you sign up for a new financial product (bank account/insurance policy/loan), you read all of the legal "fine print". ▪ *Never* ▪ *Always*	55.4	Behaviour

Section H: Engaging with Financial Service Providers

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
31	The financial data below shows how your business is financed. If you want to pay the founding team a dividend of R5 per share, how much do you need to pay the other business financiers? **Number of Shares** / **Capital Value (R)** Founding team: 200 / 10,000 Bank loan: - / 25,000 Family investor: 100 / 5,000 ▪ *Bank: R0; Family investor: R0* ▪ *Bank: R0; Family investor: R500* ▪ *Bank: R2,500; Family investor: R500* ▪ *Bank: R2,500; Family investor: R0* ▪ *Not sure*	70.6	Knowledge

Section I: Engaging with Regulators and Regulations

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
32	If your business makes a profit, then income tax will need to be paid to the tax authority. ▪ *True* ▪ *False* ▪ *Not sure*	71.1	Knowledge

Section I: Engaging with Regulators and Regulations

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
33	Assess the statement. If the directors of a business make reckless decisions, then they should be punished. ▪ *Strongly Agree* ▪ *Strongly Disagree*	55.6	Attitude
34	Once each year, your business produces financial statements. ▪ *Never* ▪ *Always*	50.7	Behaviour

Section J: General

Item No.	Question Text / Visual Information/ Key and Distractors	Flesch Kincaid Reading Ease Score	Financial Literacy Dimension
35	What does the term "business finances" mean to you?	84.9	All

4.5.1.1 Item Summary of Instrument Version 1

Version 1 of the functional business financial literacy instrument contains thirty-five items, including eight items to gather detail about the respondent and their business. There are, therefore, twenty-seven non-descriptive items, one of which is a long-form, general question. Excluding the descriptive and general questions, the instrument comprises approximately 54% knowledge items, 31% behaviour items and 15% attitude items. While knowledge items still comprise most of this instrument, there is an adequate representation of the behaviour and attitude dimensions of financial literacy relative to other financial literacy instruments in the public domain.

Table 4-2: Item Summary of Version 1

Survey Section	**# of All Items**	**# of Knowledge Items**	**# of Behaviour Items**	**# of Attitude Items**	**% of Non-Descriptive Items**
A. About You	4	n/a	n/a	n/a	n/a
B. About Your Business	4	n/a	n/a	n/a	n/a
C. Record Keeping	5	3	1	1	19.23%
D. Financial Data Preparation	5	3	2	0	19.23%
E. Financial Data Analysis	3	2	0	1	11.54%
F. Budgeting & Planning	3	1	1	1	11.54%
G. Revenue Generation	5	3	2	0	19.23%
H. Engaging with FSPs	2	1	1	0	7.69%
I. Engaging with Regulators & Regulations	3	1	1	1	11.54%
J. General	1	n/a	n/a	n/a	n/a
Non-Descriptive Items	**27**	**14**	**8**	**4**	
% of Non-Descriptive Items (excl. General)	**74.29%**	**53.85%**	**30.77%**	**15.38%**	

4.5.1.2 Alignment of Instrument Version 1 with Bloom's Taxonomy

The educational underpin for the formulation of the survey instrument is Bloom's Revised Taxonomy. As displayed in Figure 3-4 and Figure 3-5, businesses with less than fifty employees require a blend of skill levels across different topics. For this study, the formulation of the items was centred on the microbusiness skill level, which is as follows:

- *Advanced Skills: Record Keeping, Revenue Generation*
- *Standard Skills: Financial Data Preparation, Financial Data Analysis*
- *Basic Skills: Budgeting & Planning, Engaging with Financial Service Providers, Engaging with Regulators & Regulations*

The table below demonstrates the alignment of the knowledge dimension instrument items in each competency area with the relevant taxonomy category. The table excludes the descriptive instrument items and the visual information, answer key and distractors. The complete formulation of the items is presented above in Table 4-1.

Table 4-3: Cognitive Process Dimensions of Knowledge Items

Section C: Record Keeping		**Advanced Skills: Analyse/Evaluate/Create**
Item No.	**Question Text**	**Cognitive Process Dimensions**
9	You own a business called ABC Trading. Which transaction has occurred if you have the following business document?	Analyse: Can the respondent distinguish between different business source documents?
10	Business documents must be kept in paper form.	Evaluate: Can the respondent justify a decision about the mechanism and process of record keeping?
12	You have this document from a supplier. Your business is registered for VAT. You can use this document to claim R2,064 in VAT.	Analyse & Evaluate: Can the respondent distinguish between different business source documents and justify the resulting financial decision?

Section D: Financial Data Preparation		**Standard Skills: Understand/Apply/Analyse**
Item No.	**Question Text**	**Cognitive Process Dimensions**
15	The income statement shows which of the following?	Understand: Can the respondent identify the components of a financial document?
16	A bank transaction fee of R0.83 should be recorded as part of your business accounts.	Analyse: Can the respondent discriminate and classify financial transactions?
18	The following is a sample of a business cash flow statement. What is the net cash flow for the business?	Apply: Can the respondent compute the net cash flow from the sample presented?

Section E: Financial Data Analysis		**Standard Skills: Understand/Apply/Analyse**
Item No.	**Question Text**	**Cognitive Process Dimensions**

20	Make use of the information below. Calculate the gross profit margin.	Apply: Can the respondent compute the gross profit margin from the sample presented?
21	It is possible for your business to make profits but run out of cash.	Analyse: Can the respondent differentiate between profits and cash?

Section F: Budgeting and Planning		**Basic Skills: Remember/Understand/Apply**
Item No.	**Question Text**	**Cognitive Process Dimensions**
23	A new machine costs R50,000 and can be used for 5 years after which it is no longer usable. The machine allows your business to make cash profits of R7,000 per year. Buying the machine is a good business decision.	Apply: Can the respondent compute and interpret the impact of the capital budgeting sample presented?

Section G: Generating Revenue		**Advanced Skills: Analyse/Evaluate/Create**
Item No.	**Question Text**	**Cognitive Process Dimensions**
25	To increase the gross margin of your business, what step can you take?	Evaluate: Can the respondent evaluate the drivers of the gross margin and determine the necessary step?
27	Using the financial data below: how many items do you need to sell each month to pay for your monthly overheads?	Analyse: Can the respondent calculate the breakeven number of items from the data provided?
28	Your business sells goods and services to an overseas market, and your local currency strengthens. Your local currency revenue will increase.	Analyse & Evaluate: Can the respondent interpret the effect of foreign exchange rate movements and identify the result?

Section H: Engaging with Financial Service Providers		**Basic Skills: Remember/Understand/Apply**
Item No.	**Question Text**	**Cognitive Process Dimensions**
31	The financial data below shows how your business is financed. If you want to pay the founding team a dividend of R5 per share, how much do you need to pay the other business financiers?	Understand & Apply: Can the respondent calculate the dividend amount and discriminate between equity and debt capital providers?

Section I: Engaging with Regulators and Regulations		**Basic Skills: Remember/Understand/Apply**
Item No.	**Question Text**	**Cognitive Process Dimensions**
32	If your business makes a profit, then income tax will need to be paid to the tax authority.	Understand: Can the respondent recognise that compliance with the tax regulations is required?

Formulation of Version 1 of the functional business financial literacy survey instrument allowed the progression to the next steps within the instrument construction process. To ready the instrument for administration to a suitable cohort, various factors required consideration and implementation. Chapter 5 covers the feedback from the expert group and the analysis and evaluation of the results from the pilot study. These steps were undertaken before the selection of the respondent group for survey administration.

Chapter 5 Preparing for Instrument Administration

5.1 Introduction

The preparation of the first version of the survey instrument enabled two necessary subsequent steps undertaken in instrument preparation. Firstly, an expert group was established to evaluate the item formulation, thus adding to the content validity. Secondly, after incorporating expert feedback, a pilot study was conducted, and the respondent data was evaluated to further improve the test instrument before administration to the intended respondent group.

The respondent group's selection was a further methodological step undertaken before survey dissemination, which included the decision on survey administration, data collection, and ethical considerations. The decision on survey administration applied to both the expert group and the pilot group respondents.

5.2 Data Collection Methodology

There are multiple methods available for data collection via survey instruments, each with its particular advantages and drawbacks. In determining the data collection approach, a researcher must first consider the characteristics of the intended survey population and the ease of survey accessibility. Ultimately, there are budgetary constraints that will also partially dictate the most appropriate collection methodology. The methodologies often used include Computer-Assisted Telephone Interviewing (CATI), Computer-Assisted Personal Interviewing (CAPI), and Computer-Assisted Self-Interviewing (CASI). CASI survey tools are becoming increasingly prominent, given the ubiquity of internet-connected devices (Fowler, 2012).

Internet-based surveys are a convenient and inexpensive method for survey dissemination and administration. Aside from the cost-benefit of requiring minimal individual staff numbers to administer a survey and the avoidance of the associated costs of training and logistics, a further factor that reduces the administration cost is the ability to include data validity tools within the instrument itself, which reduces the data clean-up and data compilation task when readying the instrument data for analysis. An additional advantage of internet-based instruments is the ability for dynamic data collection; in other words, the items displayed can alter based on respondent input.

However, the downside of internet-based surveys is the increased likelihood of non-response. Surveys distributed via email or a similar mechanism may need additional protocols to follow-up with intended respondents to encourage a response to increase the response rate. In addition to

protocols to encourage response, the survey needs to appeal to the respondent's intrinsic motivation to complete the survey (Fowler, 2012).

A further challenge with internet-based surveys is the respondents' requirement to access the internet and have sufficient computer literacy to complete the survey. Internet-based surveys place the burden of skills on the respondent rather than the individual administering the survey.

While internet-based surveys or self-administered surveys tend to require closed-form questions, they have the advantage of having the ability to include more complex material like pictures, charts or other graphics as part of the survey instrument. Further, although there are challenges, particularly around response rates for CASI survey tools, when dealing with a geographically dispersed respondent group who are computer literate, the reduction in administration cost and the resulting accessibility of a far bigger sample group compensates for the potentially lower response rates.

This study made use of an internet-based CASI survey tool distributed electronically to the convenience survey group. As discussed in Section 3.4.4, South African smartphone penetration is over 80%, and these phones have Wi-Fi connectivity and the ability to browse the internet. Therefore, a high rate of smartphone usage and access to the internet suggests that the intended respondents are sufficiently computer literate and connected, making an internet-based survey tool an appropriate choice (Independent Communications Authority of South Africa, 2019).

5.3 Ethical Considerations

This study involved the survey of adult individuals who operated businesses within South Africa and required, amongst others, the ability to segment respondent data based on various demographic classifications. Therefore, the survey process required gathering demographic information, including data on each respondent's gender, age, and racial group, to analyse the data. At no point in the survey process was any information gathered that would allow the researcher to identify the respondent personally. The data gathered were intended for analysis on an aggregate basis and not on an individual case basis.

The researcher followed the University of Cape Town Ethics Review process, which required submitting the intended survey instrument and supporting information to a Commerce Faulty Ethics Review Committee before disseminating the instrument to the intended pilot or survey group.

The Commerce Faculty Ethics Review Committee granted ethics approval for the survey instrument. The approval is found in Appendix F.

5.4 Expert Group Input

Before conducting a pilot testing process, an expert research group was established to provide the survey instrument's content validity and construct validity. The group was constituted to ensure that it contained a blend of skills that would allow for input into the item syntax, item content, and general survey methodology.

5.4.1 Expert Group Members

Five individuals formed part of the expert group. The table below provides their qualifications and background experience.

Table 5-1: Expert Group Members

Member	**Qualifications**	**Background**
Member 1	BScEng(Hons), BCom(Accounting), PGDA, CA(SA)	This expert group member is a Chartered Accountant running an accountancy practice specialised in providing business financial management services to small and medium businesses within South Africa.
Member 2	BSc(Hons), MSc, PhD(Chem), MBA, CFA, CAIA	This expert group member is an Associate Professor at the University of Cape Town and is the researcher's doctoral supervisor.
Member 3	BBusSci(Hons), MCom	This expert group member served as Director of the Raymond Ackerman Academy of Entrepreneurial Development (RAA), a tertiary-level, post-high school level academy at the University of Cape Town's Graduate School of Business and the Soweto Campus of the University of Johannesburg.
Member 4	BA(Hons), MBA	This expert group member was the founder of the University of Cape Town Graduate School of Business Innovation Solution Space, an ecosystem for early-stage start-ups and a research and development platform for corporates.
Member 5	BCom, MBA	This expert group member founded a professional development enterprise to prepare SME owners and managers for sustainable growth and profitability using practical solutions.

5.4.2 Expert Group Input Methodology

The five expert group members were required to give three responses regarding each survey instrument item (see Table 4-1), excluding the demographic and descriptive questions. The first two solicited inputs required an indication of the degree of agreement with the posed statement using a five-point Likert scale. The third input was phrased as a general question.

- Statement One: The question and the response options are clear, understandable and unambiguous. (Strongly Disagree to Strongly Agree)
- Statement Two: The question tests the respondent's knowledge, behaviour or attitude about <insert topic being tested>. (Strongly Disagree to Strongly Agree)
- Question Three: Do you have any comments to make on this <insert topic being tested> question?

In addition to the three inputs requested for each survey item, there were three general open-ended questions at the end of the survey, as follows:

- Seven topics were covered: record keeping, financial data preparation, financial data analysis, budget & planning, revenue generation, engaging with financial services providers and engaging with regulators & regulations. Are there any broad topics that should be included but were not? Equally, should any of these seven topics have been excluded?
- Of the seven topics included, were there any topics that were not sufficiently tested? Equally, were there any topics that contained too many questions?
- Are there any other comments you wish to make?

The expert input survey was distributed electronically to the group members, and they were able to provide their insights online in their own time. The expert group's input was invaluable and greatly enhanced the functional business financial literacy test instrument's formulation. The collection of the first two inputs canvassed from the expert group was in the form of a Likert-scale input; this allowed for the construction and computation of a content validity index (CVI) on both an item and scale level. In addition to the quantitative work carried out to assess the content and construct validity inputs from the expert group, the researcher conducted a qualitative review to assess and incorporate the written open-ended feedback provided for each item, as well as the more general input solicited at the end of the instrument review.

5.4.2.1 Content Validity Index Computation

The expert group responded to the two statements about each item by indicating a five-point Likert scale their level of agreement with the statement. On the first statement, where the input

was “strongly disagree”, in other words, the expert group member felt the item was not clear, understandable and unambiguous, the Likert-scale inputs codes as the numerical value 1. Conversely, where the expert group member felt the item was clear, understandable and unambiguous, the input was coded as the numerical value 5. Similarly, where the expert group member felt that the item did not test the respondent’s knowledge, behaviour or attitude about a particular topic, the input was coded as 1, with the converse being a numerical value of 5.

The first statement that required the expert group members to evaluate the item from a written clarity perspective allows for the assessment of the content validity in addition to the implementation of a Flesch-Kincaid readability threshold requirement of 50 (Flesch, 1948). The second statement that solicited the expert input on whether the item tested was a dimension of financial literacy (knowledge, behaviour, attitude) can be considered a measure of construct validity.

Polit and Beck (2006), Delgado-Rico, Carretero-Dios and Ruch (2012), and Yusoff (2019) all compute CVI by assessing how many of the expert group members score the input code-appropriate value of four or five (indicative of strong agreement) relative to the total number of expert group members.

$$CVI_{item} = \frac{Number\ experts\ in\ agreement}{Total\ experts} \qquad \textbf{(5-1)}$$

The CVI thus expresses the proportion of experts in strong agreement. Lynn (1986) raised a concern that this CVI computation approach may result in an inflated score as there is a chance or probability that the experts agree on an item. She suggested that only a CVI of 1.00 should indicate validity when an expert group comprises five or fewer members. Tilden, Nelson and May (1990) suggested that CVI values should be greater than 0.70 and Davis (1992) proposed a minimum value of 0.80.

In addition to the computation of a CVI score per item, a Likert-scale input allows for the computation of a scale content validity index. There are two methodological approaches to the computation of a scale CVI. Zamanzadeh et al. (2015), Yusoff (2019) and Polit and Beck (2006) all provide the computational methodology for two forms of scale CVI. The more conservative computation requires universal agreement amongst the expert group members. The scale CVI on a universal agreement methodology indicates the proportion of items to achieve an input code-appropriate value of four or five (indicative of strong agreement) by *all* of the expert group members. A less conservative computation averages the item CVI scores for a particular scale. This study adopted the less conservative scale CVI computation convention and presented the

scale CVI for each of the seven instrument topics and an overall score across all items for both the content validity scores (statement 1) and the criteria validity scores (statement 2).

$$CVI_{scale} = \sum_{i=1}^{n} \frac{CVI_{item\ i}}{n} \quad \textbf{(5-2)}$$

5.4.3 Expert Group Results

The computation of the Content Validity Index was per item and for both of the statements posed to the expert group members. Statement One: "The question and the response options are clear, understandable and unambiguous" indicates content validity. Statement Two: "The question tests the respondent's knowledge, behaviour or attitude about <insert topic being tested>" is a measure of construct validity. Also computed was the scale content validity index for each of the seven topics and the instrument in total.

Appendix Table A-1 presents these CVI scores and also includes an indication or flag (demarcated by x) of those index values measuring below 0.80, indicated by Davis (1992) as a suitable minimum value. Note that a double "xx" indicates both statement 1 and statement 2 reflect an index value below 0.80.

Across the test instrument as a whole, the expert group returned an average scale CVI measure of 0.85 for content validity, which can be interpreted as partial validation of the decision to adopt the Flesch-Kincaid Reading Ease methodology in developing the survey instrument. On the other hand, the scale CVI measure of 0.75 generated by the expert panel for the construct validity indicates that version 1 of the functional financial literacy test instrument was a reasonable first attempt, but additional work on the item formulation was required.

At a topic level, the expert group indicated that the item formulations of both the internal competency topic of record keeping and the external competency topic of revenue generation required further work. It is of interest that these two areas were flagged by the expert group, considering that the researcher judged that all businesses require advanced skills in both of these topics.

The expert group survey included an open-ended question for each item and three open-ended questions related to the instrument as a whole. Appendix Table A-2 presents the comments from the item-specific open-ended questions for those instances where the CVI score for either statement one or statement two was below 0.80.

The expert group were also asked three open-ended questions at the end of the survey instrument.

- Question 1: "Seven topics were covered: record keeping, financial data preparation, financial data analysis, budget & planning, revenue generation, engaging with financial

services providers and engaging with regulators & regulations. Are there any broad topics that should be included but were not? Equally, should any of these seven topics have been excluded?

- Question 2: "Of the seven topics included, were there any topics that were not sufficiently tested? Equally, were there any topics that contained too many questions?"
- Question 3: "Are there any other comments you wish to make?"

Not all of the members of the expert group chose to include comments. The open-ended comments from those members who responded are presented in Appendix Table A-3.

The expert group proposed some additional demography-centred items to consider including in the survey instrument. For example, based on this feedback, the inclusion of questions on accounting-specific prior learning and relating to the individual(s) or the entity that prepares the business's financial records were considered. However, being mindful of the trade-off between the inclusion of additional questions to obtain further useful data and the requirement for brevity in constructing the survey instrument to minimise survey fatigue, it was decided not to add these additional questions to the survey.

While prior learning in accounting would likely allow the respondents to score more highly, especially on the knowledge-dimension items, the conceptual model of business financial literacy adopted in this study allows for the incorporation of behaviour and attitude dimensions in addition to financial knowledge. Another complication in posing a question about prior accounting training is that to be meaningful, it would need to consider the level of training. Accounting as a subject at high school or accounting as a tertiary education subject is very different, potentially requiring a further question in this regard to differentiate by year of study or capture a difference between a degree and a diploma. Moreover, a respondent who had undertaken an online bookkeeping course may also identify as having prior accounting learning. Given the above, it was reasoned that additional demographic information on prior accounting learning might be difficult to interpret meaningfully and was thus not sufficiently beneficial to justify the inclusion of another survey item.

Many small and microbusinesses likely use external accounting or bookkeeping services to prepare the business financial position or complete tax returns. However, the objective of the survey is to understand the financial literacy of the business decision-maker. Therefore, the question being addressed was whether they could meaningfully understand and act on financial information in the short and medium term, regardless of whether this is based on externally or internally prepared financial records. Thus, the view was taken that there was again insufficient

benefit to a question about who prepared the business financial information to justify an additional item.

5.5 Post-Expert Group Instrument Revision

The expert group members' input allowed for the revision and improvement of the first version of the test instrument. In some instances, the text or focus of the question item required amendment, and in other instances, the item required replacement entirely. Appendix Table A-4 sets out the original text of those items undergoing revision and the proposed revision and some commentary about the revision implemented.

The table below provides the updated item summary presented initially in Table 4-2 for Version 2 of the functional business financial literacy survey instrument. Sections A and B gathering demographic and business details from the respondents are unchanged. The instrument totals 36 items, of which eight items are descriptive. Version 2 comprises 48% knowledge items, just under 30% behaviour items, and just over 22% attitude items.

Table 5-2: Item Summary Version 2

Survey Section	**# of All Items**	**# of Knowledge Items**	**# of Behaviour Items**	**# of Attitude Items**	**% of Non-Descriptive Items**
A. About You	4	n/a	n/a	n/a	n/a
B. About Your Business	4	n/a	n/a	n/a	n/a
C. Record Keeping	5	2	2	1	19.23%
D. Financial Data Preparation	5	3	1	1	19.23%
E. Financial Data Analysis	3	2	0	1	11.54%
F. Budgeting & Planning	3	1	1	1	11.54%
G. Revenue Generation	5	3	2	0	19.23%
H. Engaging with FSPs	2	1	1	0	7.69%
I. Engaging with Regulators & Regulations	3	1	1	1	11.54%
J. General	1	n/a	n/a	n/a	n/a
Non-Descriptive Items	**28**	**13**	**8**	**6**	
% of Non-Descriptive Items (excl. General)	**76.47%**	**48.15%**	**29.63%**	**22.22%**	

Following the expert group's input and implementing the feedback, the functional business financial literacy survey instrument was deemed ready for administration to a pilot respondent group.

5.6 Pilot Group

As discussed in Section 5.8, this study constitutes exploratory analysis and hence does not require a considerable sample size, as it is not intended to generalise across a large population. The nonprobability sampling approach selected for this study is purposive sampling. The appropriate number of respondents to include in a pilot group has a lower statistical constraint. Further, as the study (and consequently, the survey items) focus specifically on microbusinesses, the intention was to target ten to fifteen microbusiness entrepreneurs to participate in the pilot survey process. These prospective respondents were sourced directly by the researcher or via appropriate contacts known to the researcher. The pilot group was selected with caution, considering that respondents that participated in the pilot group were ineligible for inclusion in the primary survey.

The link to the electronics survey instrument, generated with Google Forms, was embedded in a bulk email to the pilot group using the email distribution service provider MailChimp. The decision to use MailChimp to manage the distribution allowed for a more sophisticated "call to action" email template to be generated, the format of which was designed to be familiar and similar in look and feel to a typical corporate email. The final pilot group distribution list consisted of ten microbusiness entrepreneurs known to the researcher, and of these, nine pilot group members responded.

5.6.1 Data Preparation and Recoding

Two statistical software programmes, IBM SPSS Statistics (SPSS) and STATA, were used to conduct the necessary analysis of the respondent data. A data recoding exercise was performed to prepare the data for analysis, which included generating appropriate variable names and labels for import into the statistical data editors. Table 5-3 below indicates the section, item number, item text and variable assigned.

Table 5-3: Items and Variable Labels

Item No	Item Text	Variable Label
Section A: About You		
1	How do you describe yourself?	DEM_Gender
2	What is your date of birth?	DEM_DOB
3	Which population group best describes you?	DEM_Race
4	What is the highest level of education have you completed?	DEM_Education
Section B: About Your Business		

5	In what year did your business start operating?	BUS_BusStart
6	Which statement best describes what your business does most of the time?	BUS_Type
7	Which statement best describes your role in the business? Please check all that apply.	BUS_Involvement_NULL
8	How many people work in your business every day? If you make use of freelancers or other contract staff, count the typical number of freelancers or contract staff working each day.	BUS_Employees
Section C: Record Keeping (RK)		
9	You own a business called ABC Trading. Which transaction has occurred if you have the following business document?	RK_Invoice
10	You need to show someone a financial business document *within the next hour* from a transaction that took place three months ago. If it is not a bank statement that is needed, how hard or easy would it be for you to find the document in time?	RK_FindDoc
11	How often does someone store and capture your business financial transactions?	RK_SaveStore
12	You have this quote from a supplier. Your business is registered for VAT. You can use this document to claim back R2,064 in VAT.	RK_VAT
13	Assess the following statement. Making sure your business documents are stored and saved correctly adds to the success of your business.	RK_Attitude
Section D: Financial Data Preparation (FP)		
14	How often do you review your business profits or losses?	FP_PnLReview
15	The income statement shows which one of the following?	FP_IncomeStatement
16	A bank transaction fee of R0.83 should be recorded as part of your business accounts.	FP_SmallTransaction
17	Assess the following statement. It is acceptable for the business owner to use the business petty cash (banknotes and coins) to pay for personal expenses.	FP_PettyCash
18	The following is a sample of a business cash flow statement. What is the net cash flow for the business?	FP_CashFlow
Section E: Financial Data Analysis (FA)		
19	Assess the following statement. I am confident that I have the skills needed to analyse my business finances.	FA_Confidence
20	Make use of the information below. Calculate the gross profit margin.	FA_GPMargin
21	Assess the following statement. It is good to have *no* debt in your business.	FA_NoDebt
22	It is possible for my business to make profits but run out of cash.	FA_ProfitvCash
Section F: Budgeting & Planning (BP)		
23	A new machine costs R50,000 and can be used for 5 years after which it is no longer usable. The machine allows your business to make cash profits of R7,000 per year. Buying the machine is a good business decision.	BP_CapitalBudget
24		BP_NoCash

	How often do you think about what your business would do if it ran out of cash?	
25	Assess the following statement. It is okay for your business to spend more than budgeted on expenses.	BP_Expenses
Section G: Revenue Generation (RG)		
26	To increase the gross margin of your business, what step can you take?	RG_GPMargin
27	When you set the prices your business charges your customers for goods and services, do you include the cost of your time and effort to the business in the selling price that is paid by the customer?	RG_TimeCost
28	Using the financial data below: how many items do you need to sell each month to pay for your monthly overheads?	RG_Breakeven
29	Your business sells goods and services to an overseas market, and your local currency strengthens. Your local currency revenue will increase.	RG_FX
30	Your business functions within a broader economy. How often do you read, watch or listen to information about that economy?	RG_Economy
Section H: Engaging with Financial Services Providers (FSP)		
31	When you sign up for a new financial product (bank account/insurance policy/loan), you read all of the legal "fine print".	FSP_FinePrint
32	The financial data below shows how your business is financed. If you want to pay the founding team a dividend of R5 per share, how much do you need to pay the other business financiers?	FSP_Divdends
Section I: Engaging with Regulators & Regulations (REG)		
33	If your business makes a profit then income tax will need to be paid to the tax authority.	REG_IncomeTax
34	Assess the statement. If the directors of a business make reckless decisions, then they should be punished.	REG_Directors
35	Once each year, your business produces financial statements.	REG_AFS
Section J: General		
36	What does the term "business finances" mean to you?	General

Appendix Table C-1 indicates the numerical code assigned to each answer option. The bold text indicates the correct answers for the knowledge, behaviour and attitude items.

Instances, where the respondent was unsure of an item answer and selected the “Not sure” option were numerically coded as 999.

The instrument section that gathered detail about the respondent’s business was an item that allowed the respondents to check multiple items describing their role within the business.

> *“Which statement best describes your role in the business? Please check all that apply. I own all or part of the business; I am involved in making financial decisions for the business; I am involved in the daily business operations; None of the above statements describes my role.”*

To cater for multiple responses required the generation of four new variables to hold the numerical value: one for each checked item and the numerical value zero for unchecked items.

A new result variable was created for each knowledge dimension item. The prefix "score" was attached to each item variable name for identification, and where the item was answered correctly by the respondent, the researcher assigned a score of one. Incorrect answers were assigned a score of zero. The assignment of scores then enabled an "easy" summation of scores per respondent to generate a high-level overview of the distribution of the knowledge answers provided by the pilot respondent group.

5.6.2 Pilot Respondent Group Summary Statistics

The table below reflects the pilot group's summary statistics, which, based on convenience sampling, reflect various biases in its composition. Thus, the pilot group members do not show racial group, age, business type or business age dispersion. The male respondents, in particular, are also skewed towards having post-graduate qualifications. However, despite this inherent bias, analysis of the pilot group responses proved a valid exercise in the survey instrument's formulation.

Table 5-4: Pilot Group Summary Statistics

	Female		**Male**		**Total**	
	%	N	%	N	%	N
Total	n/a	3	n/a	6	n/a	9
Mean Age	**n/a**	**35.72**	**n/a**	**50.02**	**n/a**	**45.26**
Race						
Black African	0.0%	0	0.0%	0	0.0%	0
Coloured	0.0%	0	0.0%	0	0.0%	0
Indian/Asian	0.0%	0	0.0%	0	0.0%	0
White	100.0%	3	83.3%	5	88.9%	8
I would prefer not to answer	0.0%	0	16.7%	1	11.1%	1
Prior Education						
I have *not* completed high school	0.0%	0	0.0%	0	0.0%	0
I have completed high school (Grade 12)	33.3%	1	16.7%	1	22.2%	2
Industry qualification, trade certificate or diploma	0.0%	0	33.3%	2	22.2%	2
Undergraduate degree	66.7%	2	0.0%	0	22.2%	2
Post-graduate degree	0.0%	0	50.0%	3	33.3%	3
Business Type						

My business sells goods	33.3%	1	0.0%	0	11.1%	1
My business provides services	66.6%	2	100.0%	6	88.9%	8
My business sells goods and provides services	0.0%	0	0.0%	0	0.0%	0
Average Business Age		**8.67**		**22.17**		**17.67**

5.6.3 Pilot Group Analysis

The responses were assessed per financial literacy dimension (knowledge, behaviour and attitude). High-level details of the item analysis follow. For the sake of brevity, not every item is discussed, particularly in instances where there was no requirement for further refinements or amendments to an item.

5.6.3.1 Analysis of Knowledge Items

Of the thirteen knowledge items included in the pilot instrument, two items were assessed as requiring revision based on the pilot group results.

Table 5-5: Knowledge Dimension Item Analysis

Item No	Item Label	Item Text	Action Taken
18	FP_CashFlow	The following is a sample of a business cash flow statement. What is the net cash flow for the business?	88.9% of respondents answered this item correctly, with one respondent indicating they were "Not sure" (11.1%). Therefore, it was decided to change the formulation of this question, as the original item text formulation was arguably too obvious and did not test the conceptual knowledge behind business cash flows sufficiently.
22	FA_ProfitvCash	It is possible for my business to make profits but run out of cash.	All of the respondents (100%) answered this true/false item correctly. Therefore, this item was assessed as likely too easy and potentially leading.

Following the methodology used in the OECD PISA studies (OECD, 2009a), and despite the pilot group containing a small number of respondents (nine), using STATA, a one-parameter IRT model

(1PL) was generated to assess the item responses quantitatively. However, some of the knowledge items were ineligible for inclusion in this IRT analysis, as all of the respondents answered correctly, thus creating insufficient data variance for model inclusion. As a result, six of the thirteen knowledge items were excluded from the IRT modelling process. A typical interpretation might suggest that it was too easy or obvious if all the pilot group respondents answered an item correctly. For those items where all of the respondents answered correctly, this interpretation was evaluated, but it was concluded that whilst the lack of variability was partly due to the item formulation, it was more likely because of the pilot group bias.

Table 5-6: IRT 1PL Model Select Knowledge Dimension Items

Model Parameters		**Coefficient**	**Std. Err**	**z**	**P>|z|**	**[95% Conf. Interval]**	
Discrimination		1.017	0.575	1.77	0.077	-0.110	2.143
Difficulty							
Item No	**Item Label**[10]						
28	score_RG_Breakeven	-2.397	1.567	-1.53	0.126	-5.468	0.674
18	score_FP_CashFlow	-2.397	1.567	-1.53	0.126	-5.468	0.674
16	score_FP_SmallTransaction	-1.483	1.109	-1.34	0.181	-3.657	0.691
23	score_BP_CapitalBudget	-0.836	0.897	-0.93	0.351	-2.594	0.922
26	score_RG_GPMargin	-0.836	0.897	-0.93	0.351	-2.594	0.922
12	score_RK_VAT	-0.279	0.807	-0.35	0.73	-1.860	1.302
32	score_FSP_Dividends	0.256	0.813	0.32	0.752	-1.337	1.850

The results of the IRT one-parameter model show that the easiest items (those with the lowest coefficients) were the computation of the number of units required to breakeven (score_RG_Breakeven) and the determination of the net cash flow (score_FP_CashFlow). Thus, the IRT model confirmed the decision previously made on a qualitative basis to amend the cash flow item to increase its difficulty. The most challenging knowledge item pertained to the business's capital structure and the associated payment of dividends (score_FSP_Dividends). The diagram below shows the test characteristic curve for the seven included knowledge items. A score of five out of seven items indicates that a respondent answered just over 70% of the items correctly. The 70% threshold on knowledge items is in line with the minimum target of 70% correct responses selected by the OECD/INFE for its knowledge questions. A passing score corresponds with a latent trait (theta) of approximately zero. The latent trait or theta is measured in logits which is the unit applied to IRT measurement and is normally distributed [$\theta \sim N(0,1)$]. At a passing grade of 70% (5 items out of 7), the theta is approximately zero (-0.052). Within this pilot group sample, the "average ability" respondent achieved a passing grade of financial literacy. Given the pilot

[10] The descriptor "score" is prefixed to the variable labels to indicate the use of a score rather than the raw numerical input. The score for the knowledge items is determined as the percentage of respondents answering the item correctly.

group's discussed bias, particularly concerning higher education, it is unsurprising that the average respondent is deemed sufficiently knowledgeable.

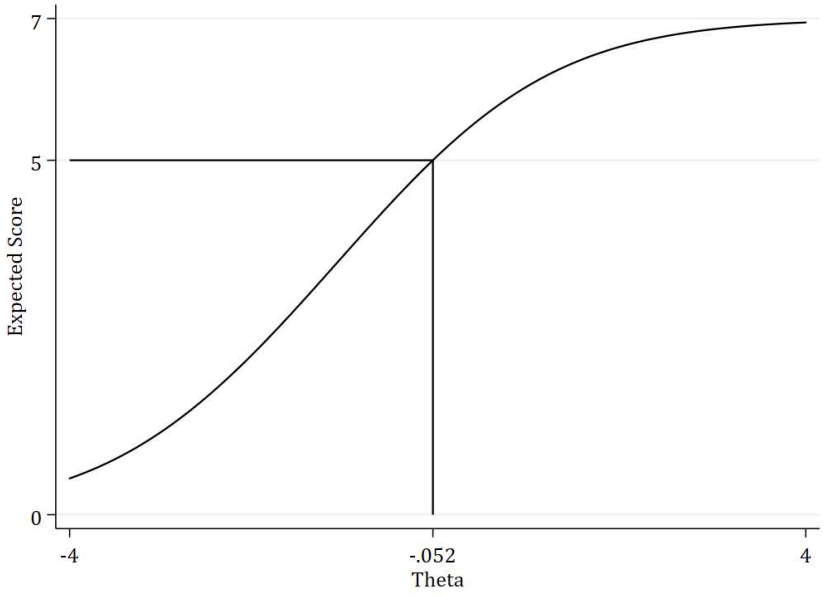


Figure 5-1: Test Characteristic Curve Select Knowledge Dimension Items

5.6.3.2 Analysis of Behaviour Items

The behaviour items included in the pilot instrument generated an acceptable amount of dispersion in the responses despite the arguable bias of the pilot group composition. Nonetheless, it was decided to revise one behaviour dimension item that asked respondents how frequently they consider running out of cash. The change resulted in the re-categorisation of the item from the behaviour dimension to the attitude dimension.

5.6.3.3 Analysis of Attitude Items

The analysis of the attitude dimension items from the pilot survey generated useful insights, indicating through qualitative review and more quantitative techniques that the attitude items captured two underlying traits. On a qualitative basis, these traits were assessed as "confidence" and "self-discipline". An exploratory factor analysis (EFA) conducted in SPSS generated quantitative confirmation of these traits, indicating two factor components with eigenvalue scores greater than one.

Table 5-7: Total Variance - Attitude Dimension - Pilot Survey

	Initial Eigenvalues			**Extraction Sums of Squared Loadings**		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	3.319	55.314	55.314	3.319	55.314	55.314

2	1.295	21.587	76.902	1.295	21.587	76.902
3	.847	14.114	91.016			
4	.360	6.006	97.022			
5	.141	2.352	99.374			
6	.038	.626	100.000			

Extraction Method: Principal Component Analysis.

SPSS was used to generate a component matrix following the factor analysis. Those items with the text inclusion "REV" indicate that the Likert Scale required reversal to align all scale items on a negative to positive scale. The component matrix results supported the qualitative identification of the two underlying attitude traits, namely "confidence" and "self-discipline". However, there was one item that was a poor fit for either of those traits and displayed a negative Pearson correlation coefficient against both component factors, namely: *"Assess the following statement. It is good to have *no* debt in your business."*

This item did not align with confidence or self-discipline and did not generate a clear-cut input from respondents on reflection. This non-alignment is likely due to the ambiguous nature of debt. Debt can be both good or bad, depending on the level of debt and the context. Thus, an appropriate level of debt can significantly enhance the growth prospects of a business by providing tax-shielded financing and leveraging the returns of the equity providers or business owners, the caveat being "appropriate level". Debt is appropriate if the debt servicing does not introduce an unnecessary or unaffordable cash burden on the business' finances. The caveat introduces an "it depends" scenario to the item. Therefore, debt can be appropriate, but this depends on the trade-off between the benefits and associated costs of servicing that debt. Given that this item is better suited to a more detailed discussion with a respondent to elicit a genuine attitude towards debt, it was decided to drop this item from the survey.

Table 5-8: Component Matrix - Attitude Dimension Pilot Survey

Item No	Variable Label[11]	Item Text	Component	
			1	2
17	FP_REV_PettyCash	Assess the following statement. It is acceptable for the business owner to use the business petty cash (banknotes and coins) to pay for personal expenses.	.907	-.192
25	BP_REV_Expenses	Assess the following statement. It is okay for your business to spend more than budgeted on expenses.	.881	-.102
34	REG_Directors	Assess the statement. If the directors of a business make reckless decisions, then they should be punished.	.818	.356
13	RK_Attitude	Assess the following statement. Making sure your business documents are stored and saved correctly adds to the success of your business.	.808	
19	FA_Confidence	Assess the following statement. I am confident that I have the skills needed to analyse my business finances.	-.408	.776
21	FA_REV_NoDebt	REV: Assess the following statement. It is good to have *no* debt in your business.	-.481	-.717

Extraction Method: Principal Component Analysis.
a. 2 components extracted.

While the exploratory factor analysis provided some interesting insights to refine the attitude items further, a note on the limitations of such analysis is important to consider. The pilot study was small and small datasets often render themselves inappropriate for statistical analysis. However, the researcher includes this factor analysis as a precursor to the work conducted in Chapter 7 on the broader respondent group.

Following a qualitative review of the pilot study responses, several other attitude items underwent revision. Appendix Table B-1 shows the attitude items and associated item revision.

[11] Those items with the included variable label text "REV" indicate that the Likert Scale required reversal to align all scale items on a negative to positive scale.

5.7 Post Pilot Group Revision

Following the analysis of the pilot group responses and additional input from an academic well-practised in survey design and interpretation, a final version of the functional business financial literacy test instrument was generated. Version 3 is presented in Table 5-9. The instrument contains eight unchanged demographic and business detail items (Sections A and B) and twenty-seven items spanning the knowledge, behaviour and attitude dimensions, including a final open-ended item. A summary is presented in Table 5-10.

Table 5-9: Version 3 Functional Business Financial Literacy Instrument

Item No	Item Text	Variable Label
Section A: About You		
1	How do you describe yourself?	DEM_Gender
2	What is your date of birth?	DEM_DOB
3	Which population group best describes you?	DEM_Race
4	What is the highest level of education have you completed?	DEM_Education
Section B: About Your Business		
5	In what year did your business start operating?	BUS_BusStart
6	Which statement best describes what your business does most of the time?	BUS_Type
7	Which statement best describes your role in the business? Please check all that apply.	BUS_Involvement_NULL
8	How many people work in your business every day? If you make use of freelancers or other contract staff, count the typical number of freelancers or contract staff working each day.	BUS_Employees
Section C: Record Keeping (RK)		
9	You own a business called ABC Trading. Which transaction has occurred if you have the following business document?	RK_Invoice
10	You need to show someone a financial business document *within the next hour* from a transaction that took place three months ago. If it is not a bank statement that is needed, how hard or easy would it be for you to find the document in time?	RK_FindDoc
11	How often does someone store and capture your business financial transactions?	RK_SaveStore
12	You have this document from a supplier. Your business is registered for VAT. You can use this document to claim back R2,064 in VAT.	RK_VAT
13	How much do you agree with the following statement? "Making sure my business documents are stored and saved correctly is critical to the success of my business."	RK_Attitude
Section D: Financial Data Preparation (FP)		
14	How often do you review your business profits or losses?	FP_PnLReview

15	The income statement shows which one of the following?	FP_IncomeStatement
16	A bank transaction fee of R0.83 should be recorded as part of your business accounts.	FP_SmallTransaction
17	How much do you agree with the following statement? "It is acceptable for the business owner to use the business petty cash (banknotes and coins) to pay for personal expenses."	FP_PettyCash
18	The following is a sample of a business cash flow statement. What is the net cash flow for the business?	FP_CashFlow
Section E: Financial Data Analysis (FA)		
19	Assess the following statement. I am confident that I have the skills needed to analyse my business finances.	FA_Confidence
20	Make use of the information below. Calculate the gross profit margin.	FA_GPMargin
21	Increasing the profits of a business always increases the cash in its bank account.	FA_ProfitvCash
Section F: Budgeting & Planning (BP)		
22	A new machine costs R50,000 and can be used for 5 years after which it is no longer usable. The machine allows your business to make cash profits of R7,000 per year. Buying the machine is a good business decision.	BP_CapitalBudget
23	How much do you agree with the following statement? "A business should always keep an amount equal to at least 2 to 3 months of business expenses in cash in the bank account."	BP_NoCash
24	How much do you agree with the following statement? "It is okay for a business to often spend more than budgeted on expenses."	BP_Expenses
Section G: Revenue Generation (RG)		
25	To increase the gross margin of your business, what step can you take?	RG_GPMargin
26	How much do you agree with the following statement? "When I set the price I charge my customers for goods or services, I should include the full cost of my time and effort."	RG_TimeCost
27	Using the financial data below: how many items do you need to sell each month to pay for your monthly overheads?	RG_Breakeven
28	Your business sells goods and services to an overseas market, and your local currency strengthens. Your local currency revenue will increase.	RG_FX
30	Your business functions within a broader economy. How often do you read, watch or listen to information about that economy?	RG_Economy
Section H: Engaging with Financial Services Providers (FSP)		
31	How much do you agree with the following statement? "When I sign up for a new financial product (bank account/insurance policy/loan), I read all of the legal "fine print"."	FSP_FinePrint
32	The financial data below shows how your business is financed. If you want to pay the founding team a dividend of R5 per share, how much do you need to pay the other business financiers?	FSP_Divdends
Section I: Engaging with Regulators & Regulations (REG)		
33	If your business makes a profit then income tax will need to be paid to the tax authority.	REG_IncomeTax

34	How much do you agree with the following statement? "It is okay for the business directors to exclude small cash sales from the financial records of the business."	REG_Directors
35	Does your business produce a full set financial statements once each year?	REG_AFS
Section J: General		
36	What does the term "business finances" mean to you?	General

Table 5-10: Item Summary Version 3

Survey Section	# of All Items	# of Knowledge Items	# of Behaviour Items	# of Attitude Items	% of Non-Descriptive Items
A. About You	4	n/a	n/a	n/a	n/a
B. About Your Business	4	n/a	n/a	n/a	n/a
C. Record Keeping	5	2	2	1	19.23%
D. Financial Data Preparation	5	3	1	1	19.23%
E. Financial Data Analysis	3	2	0	1	11.54%
F. Budgeting & Planning	3	1	0	2	11.54%
G. Revenue Generation	5	3	2	0	19.23%
H. Engaging with FSPs	2	1	1	0	7.69%
I. Engaging with Regulators & Regulations	3	1	1	1	11.54%
J. General	1	n/a	n/a	n/a	n/a
Non-Descriptive Items	**27**	**13**	**7**	**6**	
% of Non-Descriptive Items (excl. General)	**74.29%**	**50.00%**	**26.92%**	**23.08%**	

5.8 Survey Group Considerations

Before conducting a survey, sample group considerations and criteria need to be evaluated. The targeted selection of a specific group introduces research error in any study that is not census-based (does not address the entire population).

5.8.1 Sampling Process and Error

A survey-based research process may include errors from two potential sources. The error may be a random sampling error or systematic error. Random sampling error is present due to the random variation in the survey group results and impacts the accuracy of the generated results. Systematic error may arise from various biases in selecting the survey group, how the responses are collected, and analysis of the responses. Systematic error impacts the validity of the survey.

When combined with random error, a survey may be imprecise and biased, imprecise and unbiased, precise and biased, or precise and unbiased (Daniel, 2012a).

To minimise bias in the selection of the survey group, Daniel (2012) suggests a clear definition of the population group using the terms: nature of the elements, sampling units containing the elements to be selected, geographic location of the elements, and period under consideration.

Following a decision to survey a sample rather than undertaking a census requires a further decision on selecting the sample members. Probability sampling assigns every member of the target population an equal chance of inclusion in the survey, while nonprobability sampling does not assign an equal probability of selection to all population groups (Daniel, 2012b). This study used a nonprobability sampling methodology.

Nonprobability sampling is a valid sampling choice for exploratory research. It requires targeting specific members of a population, particularly in instances where the sample members are difficult to access, where the population is not homogeneous, and where there are survey resource constraints. However, nonprobability sampling renders it impossible to estimate sampling error.

5.8.2 Nonprobability Sampling

Four types of nonprobability sampling exist. These include availability sampling, purposive sampling, quota sampling, and respondent-assisted sampling. The nonprobability sampling approach selected for this study is purposive sampling. The study will purposively select the members of the group to be surveyed based on specific criteria. In selecting a purposive sample, Daniel (2012c) outlines five methodological steps:

- *Define the target population*
- *Identify inclusion and exclusion criteria*
- *Create a plan to recruit and select population elements that meet the inclusion/exclusion criteria*
- *Determine the sample size*
- *Select the targeted number of population elements*

Inclusion or exclusion criteria themselves fall into four broad categories; criteria based on central tendency, criteria based on variability, criteria based on theory or model development, and criteria based on judgement or reputation Daniel (2012c).

As this work focused on South African entrepreneurs, the inclusion criteria were based on variability to obtain a cross-section of respondents.

5.8.3 Determination of Sample Size

Following the definition of the target population group, the identification of the inclusion and exclusion criteria, and the plan to access the intended population members, there must be a determination of the sample size.

Determination of the sample size can either be in advance, known as a fixed approach or using a sequential approach that continues until the triggering of some preselected decision rules. Exploratory studies do not require samples sizes that are as large as those required in cases that use the survey results to predict or make critical decisions.

Without trivialising the role of sample size in the subsequent review and analysis of respondent information, it was attempted, within practical resource constraints, to achieve as large a sample as was possible, given the inclusion criteria and sensible time constraints.

5.9 Survey Respondent Group

Section 5.8 covered some of the survey group considerations. A targeted, nonprobability respondent group introduces various biases to the interpretation of the results. Nonprobability sampling renders it impossible to estimate sampling error and estimate the sample size in advance. An exploratory study of this nature does not require samples sizes that are as large as those required in cases that use the survey results to predict or make critical decisions.

The five methodological steps outlined by Daniel (2012c) are presented in a tabular format below.

Table 5-11: Sample Selection Methodological Steps

Step	**Methodological Description**	**Commentary**
1	Define the target population	The population comprises entrepreneurs and business owners, and managers operating within South Africa, focusing on microbusiness entrepreneurs.
2	Identify inclusion and exclusion criteria	The primary exclusion criterion was a lack of participation consent from the respondents. After that, there was an exclusion of respondents who did not meet the "involvement" criteria. These criteria required that one or more of the following conditions were true: • *The respondent owned all or part of the business* • *The respondent was involved in making financial decisions for the business*

		• *The respondent was involved in daily business operations*
3	Create a plan to recruit and select population elements that meet the inclusion/exclusion criteria	The researcher identified several distribution channels that would provide access to entrepreneurs who might complete the survey. The researcher was very aware that entrepreneurs are often very time-constrained and that there were no tangible benefits offered to survey respondents.
4	Determine the sample size	A sequential approach was selected, and the researcher endeavoured to collect respondent data for six weeks. As such, the sample size was not known in advance.
5	Select the targeted number of population elements	The researcher selected respondents who indicated that they fell into the first three of the four defined enterprise status categories. In other words, this involved the exclusion of respondents who indicated that they were part of medium-sized operations but the inclusion of sole traders and small businesses despite the survey instrument being designed with the microbusiness skill levels in mind.

As indicated in step 5 of Table 5-11, and as outlined in Section 4.5.1.2, the instrument was centred on the proposed microbusiness skill level. However, overlaying a practical and feasibility consideration to this study, it was decided to focus on three of the four enterprise status categories: sole traders, microbusinesses, and small businesses. Respondents working in medium-sized businesses with an employee number exceeding fifty were not targeted in this study.

Further, it was decided not to include differentiation between formal and informal businesses, as to enable the distinction, the survey instrument would have needed to elicit that categorisation from the respondents. There is sensitivity around formal registration within a South African context and the tax and regulatory compliance a formal registration requires. Some respondents were likely to perceive such direct questions around registration and tax compliance as information that was too personal or sensitive to share willingly.

As indicated in step 3 of Table 5-11, a multi-pronged approach to the distribution of the survey instrument to the entrepreneur respondent group was undertaken, using the following distribution channels:

- Entrepreneurial skills and training providers, including incubators
- Entrepreneurial shared workspace providers

- Social media groups
- Direct contact

To enable data analysis on a per-channel basis eleven duplicate copies of the survey were created using Google Forms. Some of the distribution channels proved particularly fruitful in gathering respondent data, whilst others failed. Three channels yielded a fast and plentiful response rate; one was an entrepreneurial training programme backed by one of South Africa's large banks, the second was a firm providing a combination of training and capital injection to more established entrepreneurs, and the final successful channel was social media platform, Facebook. The researcher targeted entrepreneurial "groups" on Facebook and was encouraged by the willingness of entrepreneurs to contribute to the research process.

For some channels, the researcher was not directly responsible for sending the instrument to the respondent cohort members, and in the case of social media distribution channels, an estimation of the number of potential respondents is impossible. As a result, an estimation of the response rate was not possible to compute. It was found that the various channels required several waves of reminders in order to encourage survey completion.

The distribution of the surveys started on 1 September 2020, and the researcher used the subsequent six weeks to follow up with the various distribution channels and encouraged them to motivate their cohort members to complete the survey.

One hundred and twenty-six responses were collected following the six-week administration process, which significantly exceeded the researcher's expectations. Of the 126 responses, two respondents indicated that they were involved in medium-sized businesses, and one respondent failed the exclusion criteria by not being a business owner or involved in the daily financial decision-making or business operations. A total of 123 useable responses was therefore collected.

Chapter 6, which follows, discusses the use of the empirical data gathered from the respondents to undertake various reliability and validity methodologies. Chapter 7 reports the respondent data, presents the business financial literacy scores per dimension, topic, and composite scores, and compares an alternative scoring computational method. Chapter 8 evaluates the respondent group's demographic and business characteristics that affect the computed business financial literacy levels.

Chapter 6 Instrument Reliability and Validity

6.1 Introduction

As stated in Section 1.6, there are three components to this study. The first objective was to compile a theoretical financial competency framework outlining the financial competencies that an entrepreneur should have to operate a business effectively. The second objective was to use the financial competencies framework to construct a valid and reliable survey instrument to test entrepreneurs' business financial literacy levels. Having constructed a financial literacy test instrument, the third component of this study undertook an exploratory study of South African entrepreneurs to identify demographic factors correlated with business financial literacy. An element that straddles the construction of the instrument and the exploratory study is the determination of the validity and reliability of the survey instrument.

The application of validity and reliability methodologies in this study can be divided into two parts: the application and results of those validity and reliability methodologies that require incorporation within the instrument construction process, which, together with the input from the expert pilot group, was discussed in Chapter 5, and those validity and reliability methodologies which are dependent on empirical survey data. The latter's application and findings, which only became possible after the survey instrument was administered to the exploratory South African entrepreneurial group, are discussed in the following sections.

6.2 Reliability and Validity of the Survey Instrument

6.2.1 Exploratory Factor Analysis

A factor analysis of the survey instrument's dimensions and topics was undertaken to assess construct validity quantitatively. Section 3.5.3 proposed a three-dimensional business financial literacy model comprising financial knowledge, financial behaviour and financial attitude, and the interrelatedness between them. These three dimensions are represented by seven different topics comprising of twenty-six question items. A key objective in factor analysis is to reduce the data to identify underlying unobservable (or latent) variables displayed in the observable variables; in other words, reducing the twenty-six items to encompass an appropriate smaller number of explanatory factors.

Factor analysis is a blend of quantitative and qualitative techniques, and the results may differ from one researcher to another using the same data if the qualitative inputs vary. An important question that requires a degree of qualitative input is the number of unobservable factors that are sensible to extract. Ideally, the analysis would indicate that each variable loads onto only one

factor. There is no consensus on how many factors to retain, and guidance is often described as a "rule of thumb", in which several measures are considered (Blunch, 2013). Some of the measures considered in the determination of factor retention are: the relationship between the sample size and the number of items; extraction of factors until a satisfactory share of the total information is retained; analysis of a scree plot; and analysis of model fit (Hong et al., 1999; Blunch, 2013).

Decisions around factor retention are centred on the relationship between the sample size or the number of cases, *N*, and the number of items, *k*, rather than the number of factors, *p*. Cattell (1978) believed the ratio of *N*:*k* should range between 3 and 6, while Gorsuch (1988) suggested a ratio value of over 5 for valid factor analysis. Hong et al. (1999) suggest that the sample size, *N*, necessary to undertake factor analysis is dependent on the specific aspects of the study, rather than the ratio *N*:*k*. These authors proposed that the degree of overdetermination affects the quality of factor analysis. Overdetermination is measurable by reviewing the ratio of the number of variables (items), *k*, to the number of factors, *p* (*k*:*p*). Highly overdetermined solutions are desirable where the number of variables (*k*) is several times the number of factors (*p*).

As twenty-six items make up the survey instrument, there are twenty-six variables (*k*) within the survey dataset and 123 cases (N). Thus, for this data sample, the *N*:*k* ratio is 123:26 (4.7), within the range proposed by Cattell (1978).

To use "model fit" as a quantitative metric in the determination of the number of factors, an exploratory factor analysis (EFA), using SPSS software, was initially conducted using a Maximum Likelihood (ML) approach. This approach enables statistical testing by presenting a goodness-of-fit test table that allows for the examination of *p*-values. By examining *p*-values for models with a varying number of factors (one factor to seven factors), it is possible to identify the point at which the *p*-value of the goodness-of-fit test becomes non-significant, resulting in model rejection (Blunch, 2013).

Table 6-1: Goodness-of-Fit ML Factor Model

Number of Factors	**Chi-square**	**Df**	***p*-value**	**Iterations Required**
1	464.762	299	0.000	4
2	365.359	274	0.000	4
3	309.801	250	0.006	6
4	262.116	227	0.055	5
5	222.047	205	0.197	15
6	187.527	184	0.414	23
7	No solution			

The *p*-value becomes (just) non-significant at a 5% significance level at a 4-factor solution. As such, it was appropriate to make use of a 3-factor model.

Blunch (2013) supports the notion that a qualitative component is present in determining the number of factors and comments that the decision rests on how many factors are substantively meaningful.

A more visual representation that aids in determining the appropriate number of factors is using a scree plot. The interpretation of the apparent "elbow" shown diagrammatically suggests that the turning point indicates the appropriate number of factors.

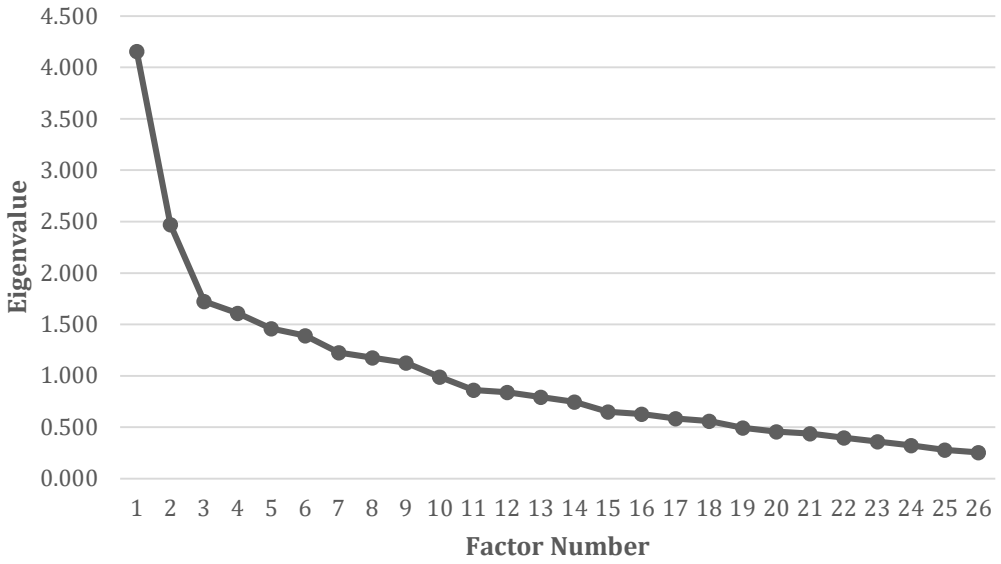


Figure 6-1: Scree Plot ML Factor Model

While the eigenvalues do not quickly diminish in value, there is an observable "elbow" at the 3-factor point. The ratio of *k*:*p* using three factors is 26:3 (8.87), which complies with the recommendation by Hong et al. (1999) to have a ratio of "several times" the number of factors.

The use of rotation techniques can simplify the underlying structure for a more straightforward interpretation of the factors. Dependent on whether the underlying relationship between the factors is believed to be correlated (oblique) or uncorrelated (orthogonal), the appropriate rotation methodology needs to be selected (Vogt, 2005). Orthogonal, or uncorrelated, rotation methodologies include varimax, quartimax and equimax, while oblique or correlated rotation methodologies include direct oblimin and promax (Dean, 2009). In this study, it was anticipated that there be a relationship between the factors. As such, an oblique promax rotation methodology was selected, allowing for correlation between factors.

A correlation matrix (Table 6-2) displaying the correlation between the factors was generated to verify and justify selecting an oblique rotation methodology.

Table 6-2: Factor Correlation Matrix

Factor	1	2	3
1	1.000	0.447	0.085
2	0.447	1.000	0.374
3	0.085	0.374	1.000

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalisation.

Table 6-2 indicates that the factors are somewhat correlated. Tabachnick and Fidell (2014) suggested that if correlations are below 0.32, then oblique rotation (correlation between factors) is not justified, and orthogonal rotation techniques are applicable. Given that the relationship between factors 1 and 2 and factors 2 and 3 display correlation coefficients more than the threshold level of 0.32 proposed by Tabachnick and Fidell (2014), the use of the promax oblique rotation method is retained.

A further step in the verification that factor analysis is appropriate is the computation of the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity (Yu & Richardson, 2015). A KMO measure greater than 0.60 was subjectively described by Kaiser (1974) as "mediocre", with values of 0.50 being the borderline of acceptability. The null hypothesis of Bartlett's test is that the correlations in the data undergoing factor analysis are zero, which would mean they were unrelated and, therefore, unsuitable for factor analysis. The null hypothesis of Bartlett's test is rejected if the *p*-values (or Sig.) < 0.05, which indicates that factor analysis is appropriate (Yu & Richardson, 2015).

Table 6-3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.658
Bartlett's Test of Sphericity	Approx. Chi-Square	715.498
	Df	325
	Sig.	0.000

The Kaiser-Meyer-Olkin measure indicated in Table 6-3 shows KMO=0.658, which is above the value of 0.60 and Bartlett's Test of Sphericity returns a value of Sig. < 0.05, which allows the conclusion that there is a structure to the data, and factors are present. As such, factor analysis was undertaken.

The Pattern Matrix resulting from EFA, using a Principal Component Analysis (PCA) extraction methodology with a promax oblique rotation, is represented below and shows the partial standardised regression coefficients of each item per factor (component).

Table 6-4: Exploratory Factor Analysis Pattern Matrix Promax Rotation - All Items

Item No	Variable Label[12]	Component 1	2	3
14	shift_FP_PnLReview	0.736		
19	FA_Confidence	0.710		
10	RK_FindDoc	0.633		
26	RG_TimeCost	0.522	-0.496	
15	score_FP_IncomeStatement	0.507		
16	score_FP_SmallTransaction	0.480		
11	shift_RK_SaveStore	0.463		
18	score_FP_CashFlow	0.438		
34	shift_REG_AFS	0.427		
25	score_RG_GPMargin	0.411	0.405	
29	RG_Economy	0.396		
23	BP_NoCash			
20	score_FA_GPMargin		0.666	
27	score_RG_Breakeven		0.615	
9	score_RK_Invoice		0.574	
31	score_FSP_Dividends		0.489	
21	score_FA_ProfitvCash		0.450	
28	score_RG_FX		0.353	
22	score_BP_CapitalBudget			
24	BP_REV_Expenses			0.720
17	FP_REV_PettyCash			0.617
12	score_RK_VAT			0.608
13	RK_Attitude			0.537
33	REG_REV_Directors			0.448
30	FSP_FinePrint			0.393
32	score_REG_IncomeTax			

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalisation.
a. Rotation converged in 7 iterations.

The Pattern Matrix is challenging to interpret in its current form. A breakdown by dimension for each of the three factors is helpful to aid the interpretation of the components. Factor (or Component) 1 comprises eleven items: four knowledge items, six behaviour items, and one

[12] The inclusion of the prefix "shift" in the variable label for items 11, 14, and 34 indicates that the numerical respondent values were adjusted in SPSS setting the input 999 (not sure, I don't review, not sure) to the numerical value 1. The prefix "score" is to indicate that the knowledge item input data have been transformed to a score using the percentage of correct responses. The inclusion of the text "REV" indicates that the Likert Scale required reversal to align all scale items on a negative to positive scale.

attitude item. Factor 2 links to six items, all of which are knowledge items, whilst attitude items dominate Factor 3.

Arguably, the item under the revenue generation topic (score_RG_GPMargin), which assessed the respondent knowledge about gross profit margins, mapped fairly evenly onto both Factors 1 and Factor 2. A practical decision was made to associate this item with Factor 2, as knowledge is required to correctly compute and interpret a business gross profit margin.

Table 6-5: Exploratory Factor Analysis Component Interpretation

	Component					
	1		**2**		**3**	
N	10	%	7	%	6	%
Knowledge items	3	30%	7	100%	1	17%
Behaviour items	6	60%	0	0%	1	17%
Attitude items	1	10%	0	0%	4	67%

A further item of interest is the attitude item housed under Factor 1 (FA_Confidence). This item is the "confidence" item addressed in Section 5.6.3.3. The confidence item proved to be distinct from the other (self-discipline) attitude dimension items within the pilot data analysis.

Undertaking a similar EFA using a PCA extraction method for the attitude dimension items (which had undergone revision since the pilot survey, see Appendix Table B-1), it was found that two components (or factors) were appropriate for the attitude items, again suggesting two different traits within the attitude dimension.

Table 6-6: Exploratory Factor Analysis Pattern Matrix Promax Rotation - Attitude Items

		Component	
Item No	**Variable Label**	**1**	**2**
24	BP_REV_Expenses	0.717	
13	RK_Attitude	0.696	
17	FP_REV_PettyCash	0.654	
33	REG_REV_Directors	0.542	-0.405
23	BP_NoCash		0.815
19	FA_Confidence		0.454

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalisation.
a. Rotation converged in 3 iterations.

Table 5-8 in Section 5.6.3.3 indicated two factors within the analysis of the pilot survey attitude dimension items, which were defined as “self-discipline” (Factor 1) and “confidence” (Factor 2). Using the data from 123 respondents adds a new item (BP_NoCash) linked to Factor 2, on which the confidence item (FA_Confidence) loaded. The remaining attitude items all continued to represent the trait of “self-discipline”.

The new Factor 2-linked item (BP_NoCash) is stated as: *“How much do you agree or disagree with the following statement? "A business should always keep an amount equal to at least 2 to 3 months of business expenses in cash in the bank account.""*

On the first impression, it could be considered that an item testing the respondent outlook towards business cash reserves (BP_NoCash) would associate with the self-discipline factor. However, the PCA results suggested that perhaps this item captured a sense of confidence or anxiety about future business viability. The mean response on this Likert-scaled item was 4.34 across 123 responses. As such, there was agreement among the respondent group that sufficient cash reserves are essential.

The context of the survey administration may also play a role with this item in particular. The administration of the survey was during September and October of 2020, a year in which many businesses (and hence respondents) had experienced first-hand the impact of insufficient cash reserves during a curtailed operating environment due to the South African Government’s lockdown response (particularly in the second quarter of 2020) arising from the COVID pandemic. Thus, this item’s responses may have generated a very different mean response had the survey administration occurred in January of 2020 rather than September.

Notably, the results of the EFA supported the conceptual model of financial literacy proposed in Section 3.5.3. Specifically, a multidimensional model consisting of three dimensions appeared appropriate, as three factors broadly mapped to the three financial literacy dimensions, Factor 1 predominantly to behaviour, Factor 2 exclusively to knowledge, and Factor 3 predominantly to attitude.

6.2.2 Item Discrimination and Difficulty

As outlined in Section 4.4.4, item discrimination and difficulty are typically analysed using either a Classical Test Theory (CTT) or an Item Response Theory (IRT) approach. The items included in the knowledge dimension are dichotomous, while the items in the behaviour and attitude dimensions include ordinal data. While there are methodologies, particularly within IRT, to evaluate ordinal data, for this study, the dichotomous knowledge items were assessed for difficulty and discrimination using both CTT and IRT methodologies. This exercise aims to

determine whether any knowledge dimension items indicate poor specification using quantitative assessment approaches, which contrasts with the expert group's qualitative input.

6.2.2.1 Classical Test Theory Approach

Following a CTT approach, Table 6-7 depicts the p-values (percentage of correct answers) for the knowledge dimension items segmented by enterprise status. Apart from one item in the budget and planning topic, the percentage of correct answers from small business respondents was higher than the percentage of correct responses from the microbusiness respondents. Similarly, except for one item within the record keeping topic, the proportion of microbusiness respondents correctly answering the items was higher than those classified as sole traders.

Table 6-7: CTT Item Difficulty

Item No	**Variable Label**	**Sole Trader**		**Micro-business**		**Small Business**		**Total**	
	N	26	Rank	68	Rank	29	Rank	123	Rank
15	score_FP_IncomeStatement	76.9 %	4	86.8 %	1	100 %	1	87.8 %	1
9	score_RK_Invoice	76.9 %	4	85.3 %	2	96.6 %	2	86.2 %	2
16	score_FP_SmallTransaction	84.6 %	3	83.8 %	4	93.1 %	5	86.2 %	2
32	score_REG_IncomeTax	88.5 %	1	82.4 %	5	86.2 %	6	84.6 %	4
22	score_BP_CapitalBudget	88.5 %	1	85.3 %	2	69.0 %	11	82.1 %	5
27	score_RG_Breakeven	65.4 %	7	80.9 %	6	96.6 %	2	81.3 %	6
20	score_FA_GPMargin	69.2 %	6	76.5 %	7	86.2 %	6	77.2 %	7
25	score_RG_GPMargin	50.0 %	10	75.0 %	8	96.6 %	2	74.8 %	8
21	score_FA_ProfitvCash	57.7 %	9	70.6 %	9	75.9 %	9	69.1 %	9
28	score_RG_FX	46.2 %	11	63.2 %	10	86.2 %	6	65.0 %	10
31	score_FSP_Dividends	38.5 %	12	51.5 %	11	72.4 %	10	53.7 %	11
12	score_RK_VAT	61.5 %	8	45.6 %	12	51.7 %	13	50.4 %	12
18	score_FP_CashFlow	30.8 %	13	33.8 %	13	62.1 %	12	39.8 %	13
	Average	64.2 %		70.8 %		82.5 %		72.2 %	

The most manageable item (the one with the highest p-value) is ranked as one, and the most challenging item carries a rank of thirteen. All respondent groups found the item testing knowledge around the payment of dividends (score_FSP_Dividends) and the determination of business cash flow (score_FP_CashFlow) difficult.

It was proposed in Section 3.4.7 that different enterprise statuses (sole traders, microbusiness, small business) require a varying level of skill in different topics. These skills levels are related to Bloom's Revised Taxonomy of educational structure as presented in Section 3.4.6 and visually represented in Figure 3-6 (basic skills, standard skills, advanced skills). The average p-value (or item difficulty) by enterprise status for topics requiring basic, standard, and advanced skills was determined (as displayed in Table 6-8) to create a simplistic overview and assess these various skill levels.

Table 6-8: Average Item Difficulty by Skill Level

	Sole Trader	**Microbusiness**	**Small Business**
Basic Skills	68%	73%	n/a[13]
Standard Skills	64%	70%	78%
Advanced Skills	60%	70%	85%

Sole traders displayed the expected pattern in that they found those items requiring basic skills the easiest (highest average p-value) and those requiring advanced skills the most difficult (lowest average p-value). However, although finding the basic items easier than the standard and advanced items, microbusiness respondents found those items requiring standard and advanced skills equivalent in difficulty.

As presented in Figure 3-6, small business respondents are defined as requiring standard and advanced skills across all topics, and therefore do not have a level of assessment for basic skills topics. Interestingly, small business respondents found items associated with advanced skills easier than those associated with standard skills.

Based on interaction with entrepreneurs of all businesses, an anecdotal reason can be proposed for this finding. Sole traders are primarily responsible for all the accounting cycle steps within their business, including record keeping. Micro and small business entrepreneurs tend to have administrative or bookkeeping assistance within their business (or as an external service) to handle the record keeping functions, and as such, they have less daily experience with record keeping. The small business respondents found the item which required distinguishing between a quote and an invoice and the resulting interpretation most challenging (score_RK_VAT), and it was the second most difficult item for microbusiness respondents.

However, it was unexpected that small business respondents found the item on capital budgeting (score_BP_CapitalBudget, rank 11) as tricky as they did, given that sole traders and microbusiness

[13] As indicated in Section 3.4.7 and Figure 3-6, this research proposes that small business respondents require skills at the standard and advanced levels only, hence no basic skill level score is computed.

respondents found this item easy by comparison. Further investigation is required to understand this response pattern.

A measure of item discrimination under CTT is the determination of the corrected item-total correlation. Förster, Happ and Molerov (2017) considered it satisfactory that their adaption of the American Test of Financial Literacy for a German respondent group showed a discrimination index, measured by corrected item-total correlation, of above 0.2 for the majority of their items. Kunovskaya, Cude and Alexeev (2014), in measuring the discrimination of six items across respondents from three different countries, comment that the variance in respondent scores influences the value of the discrimination metric and that there can be an inconsistency between item difficulty and item discrimination.

Table 6-9: CTT Discrimination Corrected Item-Total Correlation

Item No	Variable Label	Sole Traders	Micro-business	Small Business	Total
18	score_FP_CashFlow	0.461	0.463	0.197	0.449
27	score_RG_Breakeven	0.468	0.315	0.328	0.416
25	score_RG_GPMargin	0.552	0.242	0.088	0.391
20	score_FA_GPMargin	0.443	0.291	0.292	0.357
31	score_FSP_Dividends	0.353	0.180	0.565	0.338
9	score_RK_Invoice	0.493	0.179	-0.028	0.298
28	score_RG_FX	0.075	0.280	0.156	0.275
21	score_FA_ProfitvCash	0.461	0.016	0.315	0.211
15	score_FP_IncomeStatement	0.091	0.065		0.143
16	score_FP_SmallTransaction	-0.042	0.162	-0.115	0.095
32	score_REG_IncomeTax	0.266	0.167	-0.265	0.095
22	score_BP_CapitalBudget	0.116	0.031	0.382	0.032
12	score_RK_VAT	-0.022	0.026	0.085	0.004

Positive discrimination indicates that respondents with the highest total score selected the correct answer on a particular item more than respondents with a low overall score. In contrast, a negative value for discrimination suggests that low-scoring respondents answer a particular item correctly more than high-scoring respondents.

The item on cash flow computation (score_FP_CashFlow) was the most difficult for the total respondent group and showed the most favourable discrimination. The item that required quote versus invoice discrimination (score_RK_VAT) and that challenged the small and microbusiness entrepreneurs displays a negligible level of discrimination for the entire respondent group, and negative discrimination for the sole traders, implying those sole traders that answered this item correctly are amongst the more low-scoring respondents.

At this early stage in the survey instrument analysis, the item difficulty and discrimination statistics measured under CTT suggested some items within the survey instrument would benefit from further consideration in their formulation. A future instrument may be improved by asking the respondent to identify which roles within the accounting cycle they personally perform: are they responsible for the record keeping and the financial data preparation, or do they only enter the accounting process at the financial data analysis step?

6.2.2.2 Item Response Theory Approach

The formulation of Item Response Theory models are as one (1PL), two (2PL) or three (3PL) parameter logistic models, and all models estimate the likelihood of different responses from a respondent based on the characteristics of the items and the innate ability or trait of the respondents. A 1PL is usually applied to binary response items (correct or incorrect) and assumes all items are equally discriminating, with the item variance a function only of item difficulty. The assumption within a 2PL model formulation is that items vary by discrimination and difficulty (Aday & Cornelius, 2006). The selection of any model is governed by the best-fit using the least number of estimated parameters. Various quantitative steps were therefore undertaken to select whether a 1PL or 2PL model was appropriate.

Using STATA software, a 1PL model was first fitted to the thirteen knowledge items, similar to the OECD PISA studies (OECD, 2009a). Segmentation of the data is by enterprise status type. Table 6-10 presents a discrimination coefficient, which under a 1PL model is the same for all items. The discrimination coefficients for each enterprise status segment and the total respondent group (0.83) are inadequate for the knowledge items. The discrimination coefficient can be thought of as the slope of the item characteristic curve. A steeper slope indicates higher measurement precision, as a higher discrimination coefficient shows that small changes in the latent trait level show more significant changes in the probability of a correct response for a particular level of difficulty.

The 1PL model indicates each item's difficulty, with difficulty estimates reflecting the probability of a correct answer from a respondent with an average latent trait (theta = 0). The measurement unit for IRT models is logits, and as such, typically, difficulty and discrimination parameters range between -3 and 3 logits (Salkind, 2012). For example, for there to be a 50% likelihood that a sole trader would answer the item score_FP_CashFlow correctly, the respondent would present a latent trait (theta) of 1.02 standard deviations above the average; therefore, an above-average sole trader respondent has a 50% probability of answering this item correctly. This survey instrument was designed with a microbusiness skill level in mind; however, for the financial data preparation topic, which includes the score_FP_CashFlow item, it was suggested that both sole

traders and microbusiness respondents have a standard level of skill. The latent trait (theta) of 1.09 for the microbusiness respondents suggests that from a skills perspective, both sole traders and microbusinesses found this item difficult (an above-average respondent has a 50% probability of answering correctly). However, small business respondents were proposed to require advanced skills in the topic of financial data preparation and display a latent trait of -0.71, suggesting below average small business respondents showed an even probability of answering correctly.

Similarly to the approach taken in Table 6-7, a rank was assigned to each item, with a rank of one indicating the least challenging item and a rank of thirteen the most challenging.

Table 6-10: IRT 1PL Model Item Difficulty

Item No	**Variable Label**	**Sole Traders**		**Micro-business**		**Small Business**		**Total**	
	N	26	Rank	68	Rank	29	Rank	123	Rank
15	score_FP_IncomeStatement	-1.51	4	-3.00	1		1	-2.66	1
16	score_FP_SmallTransaction	-2.12	3	-2.63	4	-3.58	5	-2.47	2
9	score_RK_Invoice	-1.51	4	-2.81	2	-4.52	2	-2.47	2
32	score_REG_IncomeTax	-2.51	1	-2.47	5	-2.56	6	-2.30	4
22	score_BP_CapitalBudget	-2.51	2	-2.81	2	-1.14	11	-2.07	5
27	score_RG_Breakeven	-0.81	7	-2.32	6	-4.52	2	-2.00	6
20	score_FA_GPMargin	-1.03	6	-1.90	7	-2.56	6	-1.67	7
25	score_RG_GPMargin	0.00	10	-1.77	8	-4.52	2	-1.49	8
21	score_FA_ProfitvCash	-0.40	9	-1.42	9	-1.62	9	-1.11	9
28	score_RG_FX	0.19	11	-0.88	10	-2.56	6	-0.86	10
31	score_FSP_Dividends	0.59	12	-0.10	11	-1.37	10	-0.20	11
12	score_RK_VAT	-0.60	8	0.29	12	-0.10	13	-0.02	12
18	score_FP_CashFlow	1.02	13	1.09	13	-0.71	12	0.57	13
	Discrimination	**0.93**		**0.68**		**0.80**		**0.83**	

The determination of item difficulty using a CTT approach aligns with the results using an IRT 1PL model approach for the respondent group as a whole. The item requiring the respondents to compute the business cash flow (score_FP_CashFlow) proved the most challenging, while the respondents understood and correctly identified the components of an income statement (score_FP_IncomeStatement).

However, a 1PL model may not be the most suitable for the data, and hence a 2PL model was fitted to the data, and a Likelihood-Ratio (LR) test performed to indicate a model preference. The LR test had a Sig. < 0.05, which suggested that a 2PL model was a more appropriate choice than a

1PL model. A 2PL model provided both a difficulty and a discrimination coefficient for each knowledge item. Table 6-11 presents the results.

Using the discrimination coefficients, the 2PL model suggests that the item requiring respondents to determine a breakeven (score_RG_Breakeven) has the best ability to discriminate between respondents with varying ability, and the items testing the understanding (rather than computation) of gross profit margins (score_RG_GPMargin), as well as the computation of business cash flows (score_FP_CashFlow), were also good at discriminating between respondent abilities. These findings on item discrimination support the CTT approach's output; Table 6-9 indicated that score_FP_CashFlow, score_RG_Breakeven and score_RG_GPMargin were also the top three discriminating items.

Table 6-11: IRT 2PL Item Difficulty and Discrimination

Item No	Variable Label	Coef.	Rank	Std Err	[95% Conf.	Interval]
	Discrimination					
27	score_RG_Breakeven	2.75	n/a	1.06	0.68	4.83
25	score_RG_GPMargin	2.27	n/a	0.76	0.78	3.75
18	score_FP_CashFlow	1.76	n/a	0.56	0.66	2.87
20	score_FA_GPMargin	1.50	n/a	0.47	0.58	2.42
31	score_FSP_Dividends	1.27	n/a	0.37	0.54	2.01
9	score_RK_Invoice	1.05	n/a	0.41	0.24	1.85
15	score_FP_IncomeStatement	0.75	n/a	0.38	0.02	1.49
28	score_RG_FX	0.73	n/a	0.28	0.18	1.28
21	score_FA_ProfitvCash	0.55	n/a	0.27	0.03	1.07
16	score_FP_SmallTransaction	0.37	n/a	0.32	-0.27	1.00
32	score_REG_IncomeTax	0.34	n/a	0.32	-0.28	0.96
22	score_BP_CapitalBudget	0.15	n/a	0.28	-0.41	0.70
12	score_RK_VAT	-0.03	n/a	0.22	-0.46	0.40

Item No	Variable Label	Coef.	Rank	Std Err	[95% Conf.	Interval]
	Difficulty					
27	score_RG_Breakeven	-1.05	8	0.20	-1.44	-0.66
25	score_RG_GPMargin	-0.84	10	0.19	-1.21	-0.48
18	score_FP_CashFlow	0.35	12	0.17	0.02	0.68
20	score_FA_GPMargin	-1.13	7	0.28	-1.67	-0.59
31	score_FSP_Dividends	-0.16	11	0.19	-0.53	0.21
9	score_RK_Invoice	-2.09	5	0.66	-3.37	-0.80
15	score_FP_IncomeStatement	-2.88	4	1.25	-5.34	-0.43

28	score_RG_FX	-0.95	9	0.41	-1.76	-0.14
21	score_FA_ProfitvCash	-1.57	6	0.77	-3.08	-0.06
16	score_FP_SmallTransaction	-5.12	3	4.37	-13.69	3.44
32	score_REG_IncomeTax	-5.14	2	4.65	-14.25	3.98
22	score_BP_CapitalBudget	-10.35	1	19.65	-48.87	28.16
12	score_RK_VAT	0.52	13	6.83	-12.87	13.91

As indicated previously, it is surprising that respondents from small and microbusinesses were unable to distinguish between a quote and an invoice correctly. This item (score_RK_VAT) showed the least ability to discriminate and was unexpectedly the most challenging item.

The Test Information Function for the full range of respondents (sole traders, microbusiness, small business) shows the level of latent trait for which the combined items deliver maximum information. For the knowledge items included in this survey instrument, Figure 6-2 shows the maximum information (the peak of the test information function) was for respondents with a latent trait or theta of approximately -1.0. Maximum information at a theta value of -1.0 suggests the knowledge dimension items are best suited to the measurement of respondents with a lower level of financial knowledge (below the average value of theta = 0.0).

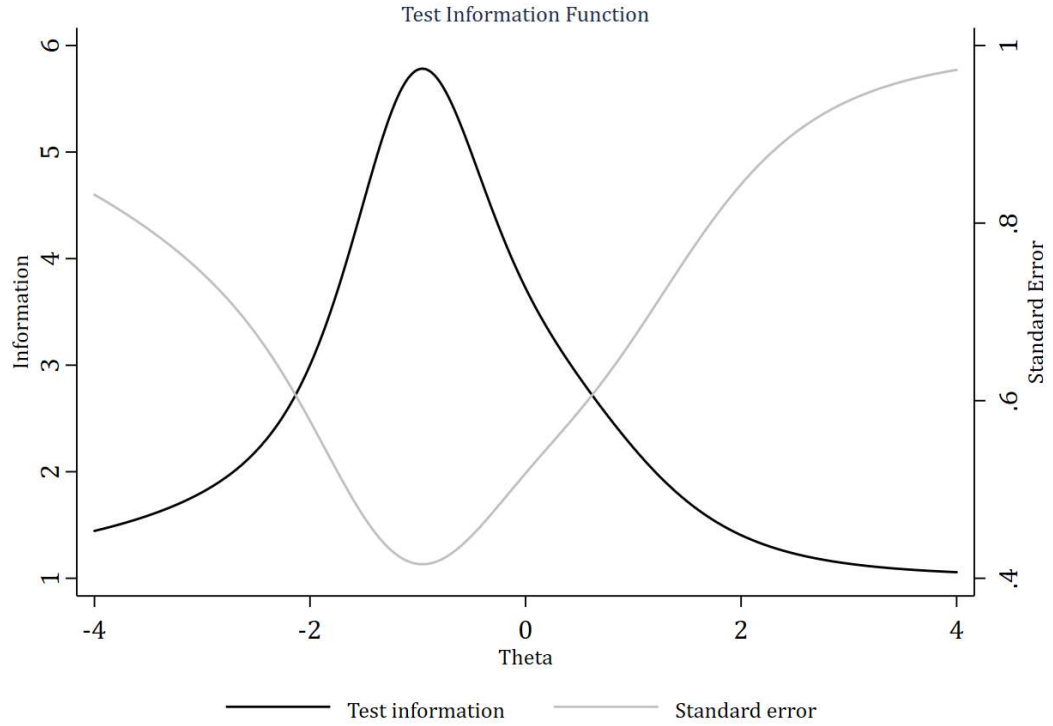


Figure 6-2: IRT 2PL Model Test Information Function

6.3 Cronbach's Alpha

Section 4.4.1 introduced concepts around the reliability of a survey instrument. The most prominent quantitative measure of reliability, a term often used interchangeably with internal consistency, is the computation of the Cronbach's alpha[14] metric. Internal consistency refers to the degree to which the items are interrelated. Researchers tend to target values above 0.7 as indicative that a survey instrument is reliable and demonstrates sufficient internal consistency. (Cronbach, 1951; OECD, 2009a; Sijtsma, 2009; Vaske, Beaman & Sponarski, 2017; Taber, 2018).

While Cronbach's alpha is used extensively to measure survey instrument reliability, many considerations need to be included in the measure's interpretation. The underlying assumptions include: tau equivalence (each item contributes to the total score), items are continuous and normally distributed, no covariance of errors, and unidimensionality. These assumptions are not often met (McNeish, 2018).

Taber (2018) suggests that, as the Cronbach alpha statistic indicates the degree to which different subsets of the items produce similar results, a high alpha value only indicates that every item in the instrument measures a similar concept to some of the other items. Sijtsma (2009) proposes

[14] Cronbach, after whom the measure is named, referred to the metric as coefficient alpha rather than Cronbach's alpha, and some researchers adopt Cronbach's naming convention.

that alpha provides an average degree of interrelatedness between items and suggests that Cronbach's alpha is not a suitable measure of internal consistency or unidimensionality.

A further important assumption that requires consideration is the number of items included in the computation. The measurement is sensitive to the number of items, with a greater number of items leading to an increase in the Cronbach's alpha numerical value (Taber, 2018). Cronbach's alpha also assumes the same level of difficulty across items, which, as indicated via both the CTT and IRT approaches, is not the case for the knowledge dimension items included in the instrument developed in this study.

Despite the limitations of Cronbach's alpha, the metric remains ubiquitous, and, as such, the Cronbach's alpha statistics derived from the administration of the survey instrument are presented in Table 6-11. As the conceptual model proposed in this study encompasses three dimensions of financial literacy, Cronbach's alpha statistics are presented by dimension (knowledge, behaviour, and attitude) and the instrument as a whole. Also presented are the number of items for better contextualisation of the statistics.

Table 6-12: Cronbach's alpha Statistics

Dimension	**Cronbach's alpha**	**Number of Items**
Knowledge	0.588	13
Behaviour	0.670	7
Attitude	0.390	6
Instrument	**0.752**	**26**

It would be tempting to follow the precedent of many papers and celebrate a Cronbach's alpha value of over 0.7 for the instrument as a whole, which would indicate instrument reliability. However, the instrument's multidimensional nature suggests that presenting and assessing Cronbach's alpha metrics per dimension is appropriate.

It is worth noting the Cronbach's alpha statistics of other survey instruments within the financial literacy area of research. Antonides, Groot and Raaij (2011) provided Cronbach alpha values ranging from 0.57 to 0.88, where behavioural and attitude items returned lower values and knowledge items returned higher alpha values; Skagerlund et al. (2018) made use of the Big Three questions plus one additional knowledge item and reported a Cronbach's alpha of 0.56, their items measuring behaviour and attitude returned values between 0.58 and 0.91. Similarly, Hung, Parker and Yoong (2009) found the Cronbach's alpha of the Big Five subset of Wave 64 of the Rand ALP survey to be 0.51. However, the Big Five items were combined with 18 other items in the survey to yield a composite Cronbach's alpha of 0.88 and the authors indicated the combined assessment rendered the instrument reliable.

The OECD provided the Cronbach's alpha value of 0.612 for their three attitude items included in the Adult Financial Literacy Competencies survey; Fernandes, Lynch and Netemeyer, Richard (2014) reported values between 0.67 and 0.95 (attitude questions had lower alpha values). Grohmann, Kouwenberg and Menkhoff (2015) reported values between 0.18 and 0.88. Their items that returned a low-reliability metric (Cronbach's alpha = 0.18) pertained to "financial socialisation". They acknowledged the low Cronbach's alpha value but opted to retain the items "for completeness" and adherence to their conceptual model.

Prior research used the results from financial literacy instruments where sections or dimensions of the instrument returned Cronbach's alpha results of less than 0.7, but where the instrument in totality has achieved a sufficient reliability metric.

Of note, during the computation of the Cronbach's alpha measure per dimension was the ability to review the effect on the value of alpha should a particular item be removed. Within the knowledge and behaviour dimensions, removing any particular item did not appear to make a material difference to the value of the alpha metric. However, as shown in Section 5.6.3.3, there appeared to be two distinct factors within the attitude dimension on analysis of the pilot group results, and this was again found in the analysis of the whole survey group in Section 6.2.1. The traits associated with these factors were labelled "confidence" and "self-discipline". Splitting the attitude dimension into its two traits and removing the items related to the confidence factor (FA_Confidence and BP_NoCash) from those related to the self-discipline factor discernibly changed the numerical value of Cronbach's alpha. Within the attitude dimension, excluding the confidence-related items, increased alpha values from 0.390 to 0.547 (six items and four items, respectively).

The variance in the alpha value in the attitude dimension suggests that the two traits remain and that the degree of interrelatedness among the attitude items is low. Despite the objective of many papers to maximise Cronbach's alpha to demonstrate reliability or internal consistency, this should not be the sole focus without considering the context of the specific study involved. In this case, a lower alpha value for the combined attitude dimension is understandable, as it does not satisfy the Cronbach alpha assumption of unidimensionality and should be split into its two component factors. This finding is in line with previous research, including the OECD Adult Financial Competencies survey, in which attitude items tend to have lower reliability levels as measured by Cronbach's alpha (OECD, 2016a). Attitude is a vast content domain, which is typically measured by very few content items, resulting in comparatively low values of Cronbach's alpha. Within this survey instrument, it is considered useful and additive to the study that the two different attitude traits (confidence and self-discipline) are measurable and not

necessarily interrelated (hence the lower Cronbach value). However, when the instrument is assessed as a composite, the reliability is above the generally accepted threshold value of 0.7.

6.4 Commentary on Survey Reliability and Validity

Several empirically driven tests were conducted to assess the instrument's validity and reliability. An explanatory factor analysis approach was used to evaluate the construct reliability. While there is evidence to suggest that the attitude dimension comprises two different traits, the three-dimensional nature of the proposed financial literacy construct was confirmed by this approach's results. However, the subjectivity involved in selecting the number of factors within the EFA process is recognised and acknowledged.

Both the Classical Test Theory and Item Response Theory Methods for determining knowledge item suitability indicate the formulation of the survey instrument items to be broadly satisfactory. However, there are knowledge items that could be amended for a future broader administration of the survey, particularly the record keeping item requiring identifying a quote against an invoice. The item that tested the ability to compute business cash flow, which arguably is critical for business viability, and items requiring the computation and analysis of gross profit margins, breakeven levels, and an understanding of the capital structure were both difficult and discriminating.

While the current item formulation is likely more suited to respondents with lower levels of financial literacy due to the determination of a latent trait of -1.0 using a 2PL IRT model, and high p-values obtained using a CTT approach, subsequent work could build off these items to refine further an instrument that measures the financial literacy levels of entrepreneurs with varying levels of financial literacy.

The computation of the Cronbach's alpha metric as a measure of instrument reliability has extensive precedent within survey instrument research. The instrument, comprising twenty-six items, returned an alpha metric of over 0.7, which is generally interpreted as sufficiently reliable.

Chapter 7 reports on the data gathered from the administration to the South African entrepreneurial cohort, and Chapter 8 analyses the factors that appear to influence functional business financial literacy levels amongst this exploratory sample.

Chapter 7 Survey Results

7.1 Introduction

This chapter reports the results of the exploratory survey of South African entrepreneurs. The proposed conceptual model of business financial literacy and the structure of the financial competencies framework allow for the presentation of results from the South African cohort in several segments. Overlaid on the presentation of the data by dimension (knowledge, behaviour and attitude), by topic (record keeping, financial data preparation, financial data analysis, budgeting and planning, revenue generation, engaging with FSPs, engaging with regulations) and aggregate, is the ability to segment the results by various demographic factors, namely: respondent age, race, gender, educational attainment, business age, enterprise status and business type.

As discussed in Section 2.4, several methodologies can be utilised in the computation of aggregate scores across items. In addition to the presentation of the cohort results, this chapter also contrasts a different methodology for the computation of a composite score, specifically applied to the knowledge dimension. Chapter 8 uses the computation of the scores to undertake a univariate and multivariate analysis to understand better the observable demographic characteristics that influence this exploratory cohort's financial literacy levels.

7.2 Survey Respondent Profile

The table below provides an initial demographic overview of the one hundred and twenty-six survey responses before excluding the three cases that failed the inclusion criteria (see Section 5.9).

Table 7-1: Overview of Survey Respondents

	Sole Trader		Microbusiness		Small Business		Medium Business		Total	
	N	%	N	%	N	%	N	%	N	%
Total	**26**	**20.6%**	**69**	**54.8%**	**29**	**23.0%**	**2**	**1.6%**	**126**	**100%**
Gender										
Male	9	34.6%	38	55.1%	20	69.0%	2	100.0%	69	54.8%
Female	16	61.5%	31	44.9%	7	24.1%	0	0.0%	54	42.9%
Transgender	1	3.8%	0	0.0%	2	6.9%	0	0.0%	3	2.4%
Race										
Black African	10	38.5%	27	39.1%	5	17.2%	0	0.0%	42	33.3%
Coloured	2	7.7%	8	11.6%	5	17.2%	0	0.0%	15	11.9%
Indian/Asian	0	0.0%	3	4.3%	3	10.3%	0	0.0%	6	4.8%
White	14	53.8%	26	37.7%	15	51.7%	2	100.0%	57	45.2%
Prefer not to answer	0	0.0%	5	7.2%	1	3.4%	0	0.0%	6	4.8%
Education										
Not completed high school	1	3.8%	1	1.4%	0	0.0%	0	0.0%	2	1.6%
Completed high school	5	19.2%	7	10.1%	2	6.9%	0	0.0%	14	11.1%
Industry qualification, trade certificate or diploma	9	34.6%	16	23.2%	4	13.8%	0	0.0%	29	23.0%
Undergraduate degree	4	15.4%	16	23.2%	10	34.5%	0	0.0%	30	23.8%
Post-graduate degree	7	26.9%	29	42.0%	13	44.8%	2	100.0%	51	40.5%
Business Type										
Goods	6	23.1%	14	20.3%	2	6.9%	1	50.0%	23	18.3%
Services	14	53.8%	40	58.0%	17	58.6%	1	50.0%	72	57.1%
Goods and services	6	23.1%	15	21.7%	10	34.5%	0	0.0%	31	24.6%
Mean Respondent Age*	**38.81**		**37.85**		**42.48**		**44.57**		**39.18**	
Mean Business Age*	**3.62**		**4.81**		**11.41**		**19.00**		**6.31**	

** Age as of 31 October 2020*

The respondents were targeted as part of a purposive, exploratory study; unsurprisingly, the respondents' composition does not mirror South Africa's population. There are some visually apparent biases in the composition of the respondent group.

According to the 2019 South African demographic data published by Statistics South Africa, 48.8% of the South African population is male, and 51.2% is female. The racial makeup of South Africa is 80.7% Black African, 8.8% Coloured, 2.6% Indian/Asian and 7.9% White (Statistics South Africa, 2019b).

The survey respondent group displays a gender split of 54.8% male, 42.9% female and 2.4% transgender. The respondents' racial breakdown is 33.3% Black African, 11.9% Coloured, 4.8% Indian/Asian, 45.2% White, and 4.8% of respondents chose not to provide their racial demographic details.

As indicated in Section 5.8, to limit this study's scope to a manageable size, the intention was to exclude responses from those involved in a medium-sized business. Therefore, the responses from the two medium business entrepreneurs were removed from further analysis. Also excluded from the further analysis was one microbusiness respondent who indicated that they were not a business owner or involved in the financial or daily operational decision-making.

In terms of education, 51 out of 126 respondents (40.5%) indicated that they had attained a post-graduate degree, while 23.8% confirmed an undergraduate degree. Therefore, 64.3% of respondents had completed university studies. Additionally, 23.0% had an industry qualification, trade certification or diploma. Therefore, 87.3% of respondents had engaged in post-high school education and training, indicating that the sample displays a bias towards a much higher education level than the South African population as a whole. However, further research examining entrepreneurs' typical educational attainment, both opportunistic and necessity-based, would be insightful and allow better context for this finding.

The respondent sample's mean age is just over 39 years, with the mean age of microbusiness entrepreneurs (the youngest segment) at just under 38 years. The South African population's median age is approximately 28 years, so the respondent group are older by slightly over ten years than the average South African.

Service-based businesses dominate all enterprise status categories over goods-based or hybrid businesses. The two medium-sized businesses are materially older than the other business categories, leading to a mean business age for the total sample (before exclusion) of 6.31 years. Following the removal of the necessary data (as discussed above), the cohort mean business age is 6.15 years. The small business status category remains the oldest on average (11.41 years),

while microbusinesses are older than the sole traders' mean age (4.88 years and 3.62 years, respectively).

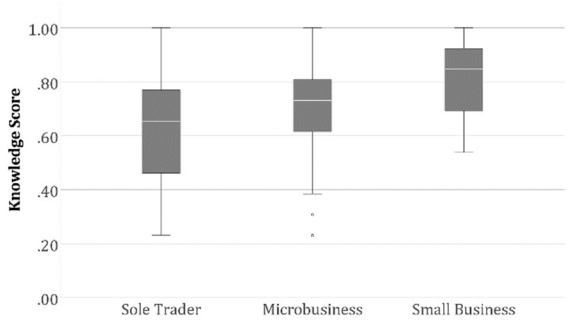
From the above, it is clear that the final sample is not representative of the South Africa population or (most likely) of entrepreneurs in the country. However, this is not considered a critical limitation, as the study's objective is limited to developing and testing a survey instrument culminating in an exploratory survey only. This study does not draw any definitive general conclusions regarding the population as a whole. As indicated in Section 9.5, a much larger nationwide survey using the instrument developed in this study is suggested for future research.

7.3 Knowledge Dimension Results

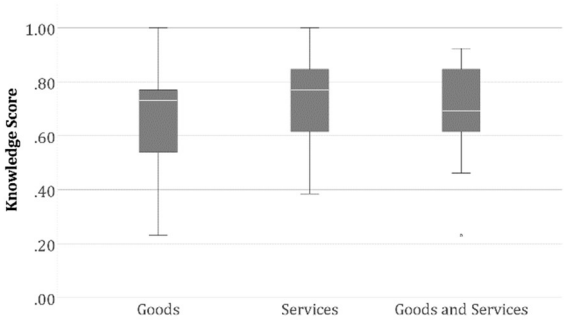
For review purposes, scores are computed on a simplistic basis as the number of correct item responses as a percentage of the total knowledge items; in other words, all items are equally weighted in the score computation[15]. The OECD/INFE survey instrument (OECD, 2016a) sets a minimum financial literacy target of respondents achieving correct answers to 70% of the questions within the financial knowledge dimension. There are thirteen knowledge items across the survey instrument developed in this study; therefore, a percentage score of 70% implies nine correct answers. However, it is worth noting that no prior research has justified selecting a 70% threshold as the differentiator between financial literacy and illiteracy. Despite the potential lack of justification for selecting a 70% level, various demographic segmentations fail to achieve the targeted minimum 70% cut-off score. Chapter 8 provides an analysis of the differences in scores achieved by the various demographic segments.

Figure 7-1 indicates box plots of the knowledge scores segmented by enterprise status, business type, race, gender and educational attainment. Also included are scatter plots of the knowledge scores against the respondent age and business age. Appendix Table D-1 presents the tabular version of these data.

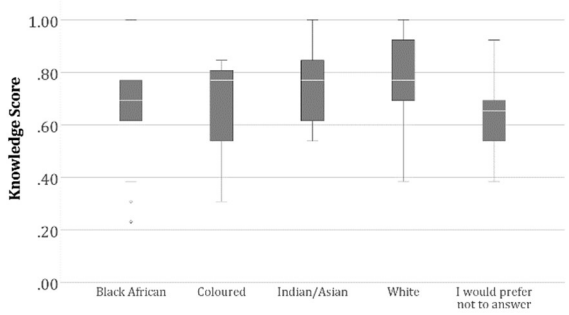
[15] Note that Section 7.9 presents a comparison and contrast of different scoring methodologies for the knowledge dimension items.



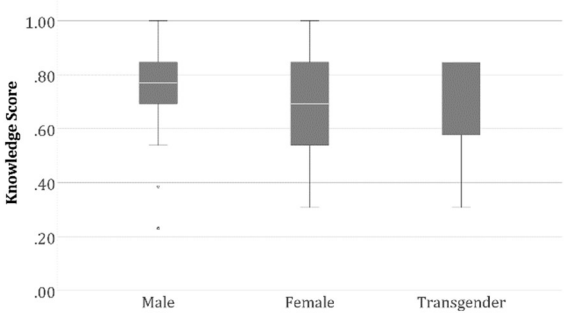
Knowledge scores by Enterprise Status



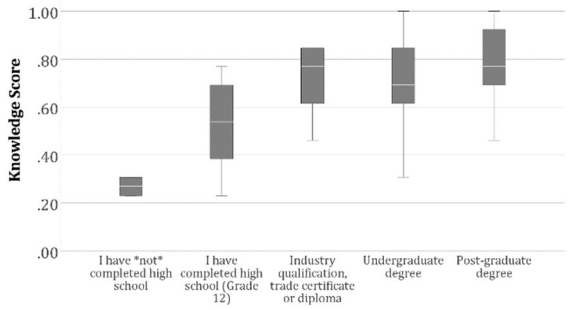
Knowledge scores by Business Type



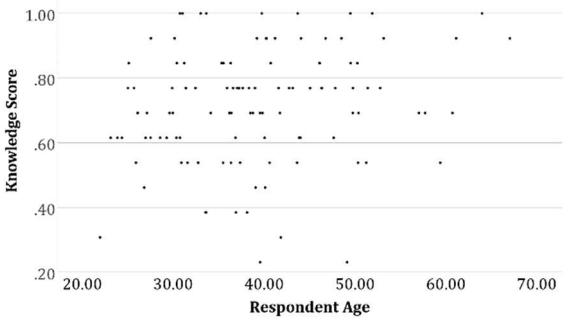
Knowledge scores by Race



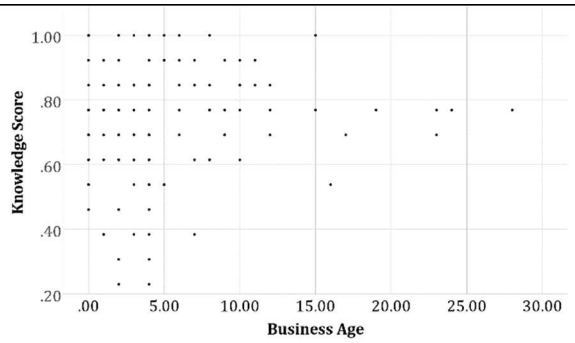
Knowledge scores by Gender



Knowledge scores by Educational Attainment



Knowledge scores vs Respondent Age



Knowledge scores vs Business Age*

** Business age axis rescaled and one small business established in 1950 not visually presented*

Figure 7-1: Knowledge Scores

7.3.1 Comments on Knowledge Items

Section 6.2.2 allowed for some initial interpretation of the results of the thirteen knowledge items. Most respondents answered the item on income statement composition correctly and the item on cash flow computation incorrectly.

An alternative mechanism to assess the knowledge item scores is to analyse the frequency with which respondents select "not sure" in response to the item stem. Across the respondent group, the item testing the payment of dividends to different capital structure providers generated 31.7% "not sure" responses (39 of 123 responses), and for the item on cash flow computation, 23.7% of respondents answered with "not sure" (29 of 123 responses).

Proportionally, sole traders answered the most items with "not sure" (12.7%) versus microbusiness respondents (8.8%) and small business respondents (4.0%). Reviewing the disparity by gender, female respondents answered "not sure" more frequently than male respondents under all enterprise status classifications. The one transgender respondent in the sole trader enterprise category was particularly uncertain on the knowledge items, responding "not sure" to six of the thirteen items. These data are available in Appendix Table D-2.

As assessed in Section 6.2.2, the item requiring respondents to identify a quote against an invoice correctly (RK_VAT) proved troublesome for micro and small business entrepreneurs. However, only 9.8% (12 of 123) of respondents indicated they were "not sure" on this item, demonstrating that respondents were confident on this item and unaware that they were error-prone.

A possible reason for this is that, in the researcher's experience, there tends to be a perception among entrepreneurs that business record keeping tasks are not as "business-critical" as work on the business' products, service offering or sales and distribution channel. The record keeping task is dismissed as necessary but not a task to which much time or business resources are devoted. It is possible that entrepreneurs may overestimate the ease of this task and their knowledge in this area. Also, the record keeping task is often outsourced, possibly resulting in a lack of understanding and knowledge on the entrepreneur's part regarding this critical aspect of the business.

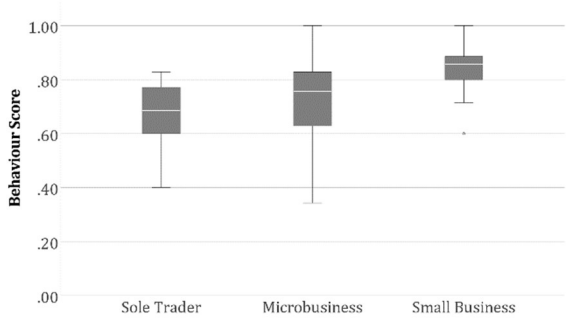
7.4 Behaviour Dimension Results

The seven behaviour items included in the survey instrument required respondents to indicate a blend of response types. Some items tested the frequency of specific behaviour, while others required a Likert-scaled agreement or disagreement response. The classification of behaviour scores closer to the numerical value of five is considered good financial behaviour, and behaviour scores closer to the numerical value of one is considered bad financial behaviour. Three

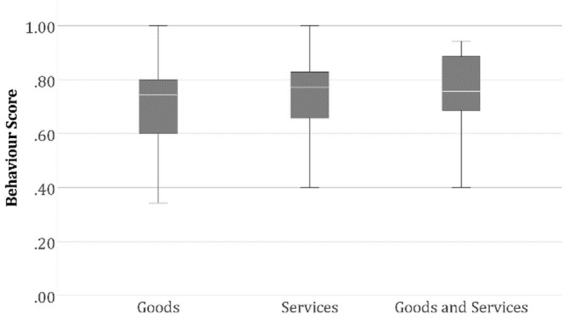
behaviour items were reverse coded to adhere to this classification. These scores were then normalised to make them more comparable with the knowledge scores. Therefore, a behavioural score of three out of a maximum of five is equivalent to a normalised score of 0.6.

Two of the seven behaviour items included an option for a respondent to indicate “not sure” to a particular behaviour. The behaviour responses were aligned into the numerical categories one to five, and therefore, the “not sure” responses were recoded to a value of one on those items, suggesting the behaviour did not occur or took place very infrequently.

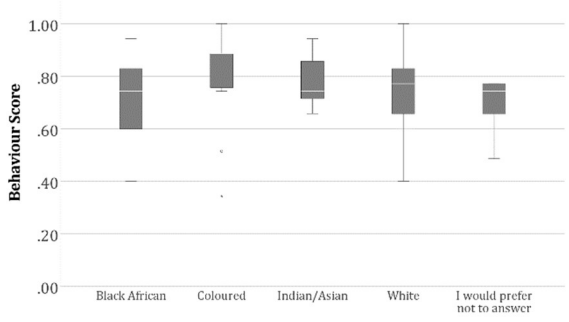
These data segmented by demographic factors and business characteristics are presented in Figure 7-2.



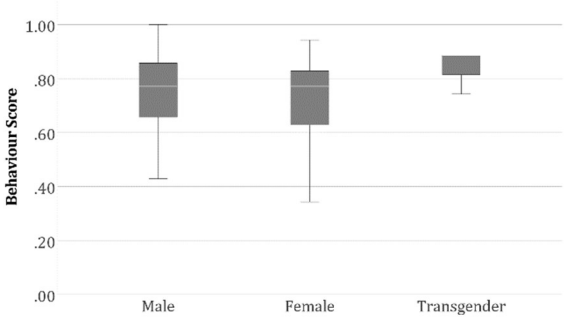
Behaviour scores by Enterprise Status



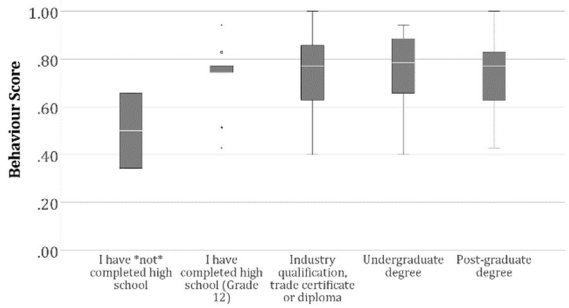
Behaviour scores by Business Type



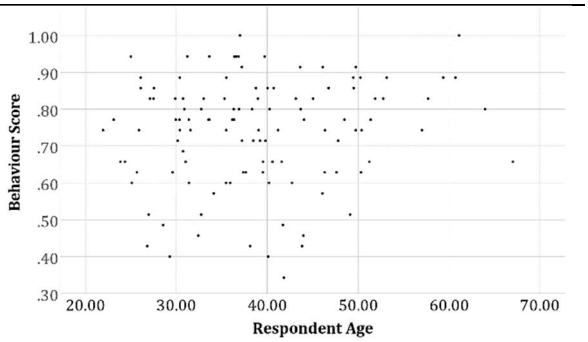
Behaviour scores by Race



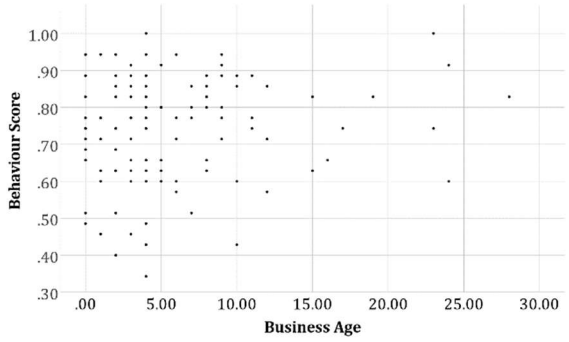
Behaviour scores by Gender



Behaviour scores by Educational Attainment



Behaviour scores vs Respondent Age



Behaviour scores vs Business Age*

** Business age axis rescaled and one small business established in 1950 not visually presented*

Figure 7-2: Behaviour Scores

7.4.1 Comments of Behaviour Items

Appendix Table D-4 shows the breakdown of the responses segmented by enterprise status. A few unexpected responses arise from the behaviour items. Under the sole trader classification, the respondents indicate that just under 20% of them would experience difficulty locating a financial record within an hour (RK_FindDoc). The difficulty in this task suggests an inadequate record keeping system and likely one that is not digitised. The ability to produce a business record quickly challenged only small numbers of microbusiness and small business respondents.

The frequency of record keeping (RK_SaveStore) was surprising. Across the whole respondent group, almost a third only capture their business transactions monthly, and a further 13% have a less frequent than monthly data-capture process. Without the continuous capture of records, the data becomes stale, and incorporation of stale data into the business decision-making process is not practical. Perhaps as evidence of the infrequency of financial data capture, sole traders indicated that 23.1% do not review their business profits and losses, and a further 26.9% review less frequently than monthly (FP_PnLReview). The low frequency of review confirms the lack of use of financial data as part of the business decision making process.

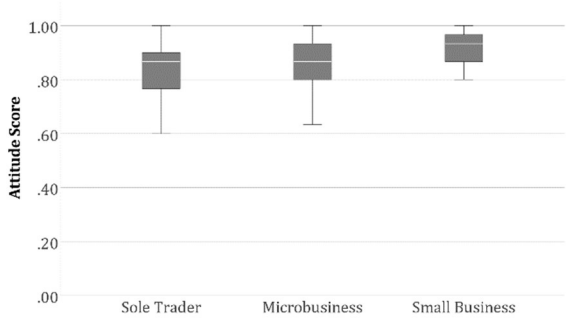
The majority of respondents indicated that they incorporate their time and effort into their product pricing (RG_TimeCost), and the majority also keep abreast of the broader economic environment (RG_Economy).

A third of respondents admit to not reading all of the legal fine print when initiating a new financial service product (FSP_FinePrint), but this is countered by just under half of the respondents who do read the details of a new contractual relationship. The remainder indicated neutrality on this Likert-scaled agreement item.

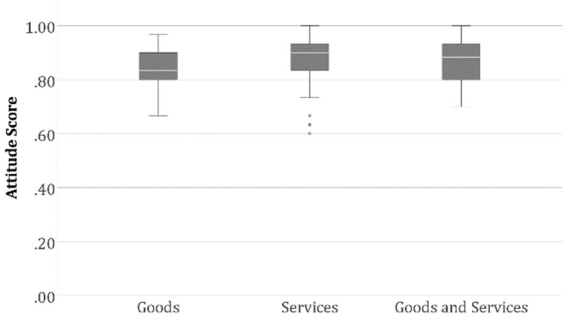
96.6% of small businesses always produce annual financial statements, which is unsurprising as the regulatory environment in which they operate enforces this process (REG_AFS). A curious response is that 19.2% of sole traders are “not sure” about the production of annual financial statements. This result suggests that sole traders may not know what the production of annual financial statements implies and that perhaps they do not segregate their personal finances from those of their business.

7.5 Attitude Dimension Results

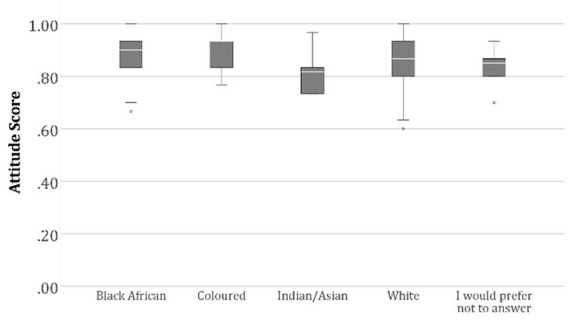
The six attitude items all required a Likert-scaled agreement or disagreement response. Three of the six items were reverse coded, and these were adjusted so that a good attitude carried a score closer to five, and a bad attitude carried a score closer to one. Similarly to the behavioural scores approach, the attitude score was normalised to reflect a score between zero and one. Figure 7-3 presents the composite attitude scores across the six attitude items.



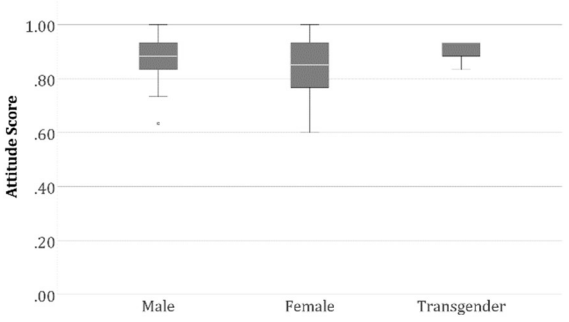
Attitude scores by Enterprise Status



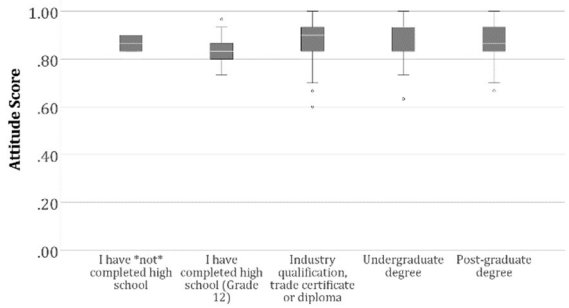
Attitude scores by Business Type



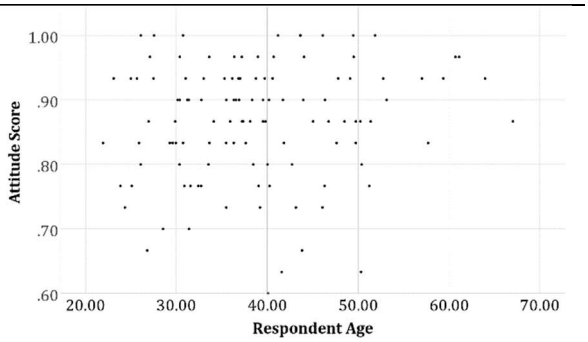
Attitude scores by Race



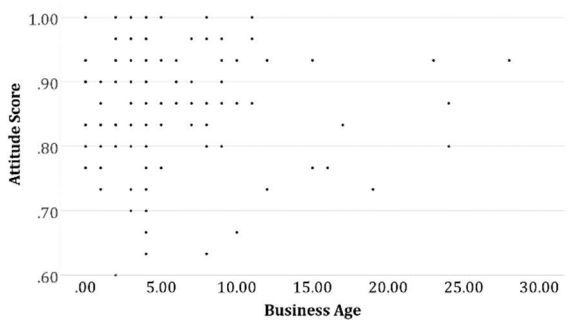
Attitude scores by Gender



Attitude scores by Educational Attainment



Attitude scores vs Respondent Age



Attitude scores vs Business Age*

** Business age axis rescaled and one small business established in 1950 not visually presented*

Figure 7-3: Attitude Scores

7.5.1 Comments on Attitude Item

Appendix Table D-5 shows the mean scores for the six attitude items segregated by enterprise status. The scores are all close to five, reflecting a positive attitude across all items and enterprise status classifications. The lowest scores are associated with the item, which asked if respondents were confident they had the necessary skills to analyse their business finances (FA_Confidence). Sole traders were the least confident on this measure.

As outlined in Section 6.2.1, the attitude dimension comprises two traits, self-discipline and confidence. Table 7-2 displays the attitude item means split by the two identified traits. There are conflicting opinions on the use of mean in ordinal data scales; a mean assumes the categories' numerical scale is equivalent. However, despite potential concerns that the Likert categories may not be evenly distributed, the mean scores for the attitude items present an interesting profile. Without verifying the statistical validity, all enterprise status businesses show lower confidence scores relative to self-discipline scores, and sole traders show the lowest combined scores and small business respondents the highest scores.

Table 7-2: Mean Attitude Scores per Trait

	Sole Traders	**Microbusiness**	**Small Business**	**Total**
Confidence	3.56	3.79	4.40	3.89
Self-discipline	4.53	4.52	4.73	4.57
Total	4.21	4.28	4.62	4.34

7.6 Topic Results

Within the three dimensions of financial literacy examined, the items were separated into two competencies (internal and external competencies) and then into seven topics. Four topics, namely record keeping, financial data preparation, financial data analysis and budgeting and planning, formed the internal competencies. Revenue generation, engagement with financial services providers, and engagement with regulators and regulations made up the external competency topics.

Using the normalised behaviour and attitude scores, together with the knowledge scores, allowed for generating a score for each topic area as the mean score of the items comprising that topic.

Table 7-3: Mean Topic Scores per Enterprise Status

Internal Competencies

	Sole Trader	Micro-business	Small Business	Total
Record Keeping (RK)	0.72	0.75	0.84	0.76
Financial Data Preparation (FP)	0.69	0.73	0.86	0.75
Financial Data Analysis (FA)	0.63	0.71	0.82	0.72
Budgeting and Planning (BP)	0.86	0.85	0.84	0.85

External Competencies

	Sole Trader	Micro-business	Small Business	Total
Revenue Generation (RG)	0.60	0.75	0.90	0.75
Engaging with FSPs (FSP)	0.52	0.57	0.72	0.60
Engaging with Regulators and Regulations (REG)	0.82	0.84	0.93	0.86

All enterprises status categories display the lowest composite mean score per topic for the external competency "Engaging with Financial Service Providers". Section 3.2 cited prior research on the reasons behind business success and failure. A critical reason substantiated in various operating environments is a lack of access to business financial capital.

Business capital, either equity or debt capital, is traditionally provided by financial services providers in the form of retail banks, start-up incubator investors, venture capital or private equity investors. Although not formally classified as financial services providers, many smaller businesses access business capital via public sector channels in the form of government-funded or non-government organisations (NGOs).

The finding that there is a weakness in this area strongly suggests that further research and potential intervention is required. Any financier, irrespective of their motivation (profit or social good), needs an entrepreneur to meet their various due diligence processes, much of which will require engagement with a financial services provider. Therefore, it becomes critical for those businesses that require a capital injection to have the skills and competencies to participate in that process adequately.

Sole traders score below 0.7 (or a 70% threshold) in three of the seven topic categories, in addition to engagement with financial service providers. Thus, their composite scores in financial data preparation, financial data analysis, and revenue generation are lower than those of microbusiness or small business respondents. However, under the topics of record keeping and

revenue generation, it was proposed that sole traders should have the same skill level (advanced) as microbusiness and small business respondents. On these topics in particular, given that the survey instrument was designed with alignment to the microbusiness skill level, it was expected that there would be little difference in scores.

A topic that presents a different pattern across the enterprise status classifications is budgeting and planning. In this topic, sole traders achieve the highest mean score, while in all other topic categories, their mean score is lower than that of the microbusiness and small business respondents.

Under all topics (excluding budgeting and planning), small business respondents achieve the highest scores.

7.7 Results by Proposed Competency Level

While the previous sections presented the results by dimension and topic, this section presents scores by competency level. An initial discussion of the perceived difficulty of the responses, segmented by the skill levels assigned to different enterprises status classification, was presented in Section 6.2.2. Sole traders found those items associated with basic skills easiest; however, microbusiness showed no differentiation between standard and advanced skill items. Small business respondents found the advanced skill items easier than the standard skill items.

Using the mean scores per topic for different status enterprises allowed the mean score by skill level to be computed.

Table 7-4: Mean Scores by Skill Level and Enterprise Status

	Sole Trader	**Microbusiness**	**Small Business**
Basic	0.71	0.76	n/a[16]
Standard	0.69	0.72	0.83
Advanced	0.66	0.75	0.87

Table 7-4 presents the skill level mean scores across all three dimensions (knowledge, behaviour, attitude) by enterprise status (See Section 7.8 for composite score computation). It is proposed that small business respondents have a combination of standard and advanced skills across the seven topics, and as such, there is no score for basic skills.

[16] As indicated in Section 3.4.7 and Figure 3-6, this research proposes that small business respondents require skills at the standard and advanced levels only, hence no basic skill level score is computed.

Similar to the findings when assessing the knowledge dimension items only, sole traders display a typical profile, scoring most highly on items associated with basic skills and least highly on advanced skill items.

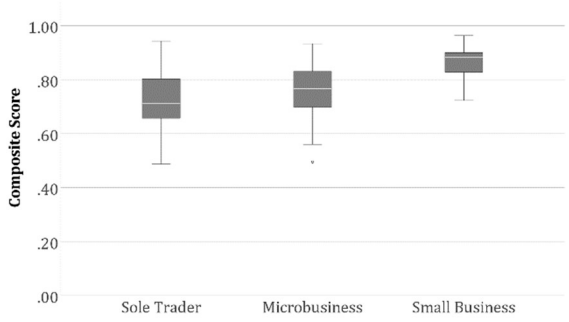
Microbusinesses have the lowest scores on standard items (financial data analysis and financial data preparation) and a higher score in advanced skill items (record keeping and revenue generation).

Small businesses also score more highly on the advanced skill items (record keeping, financial data preparation and revenue generation) than standard skill items (financial data analysis, budgeting and planning, engaging with FSPs and engaging with regulators and regulations).

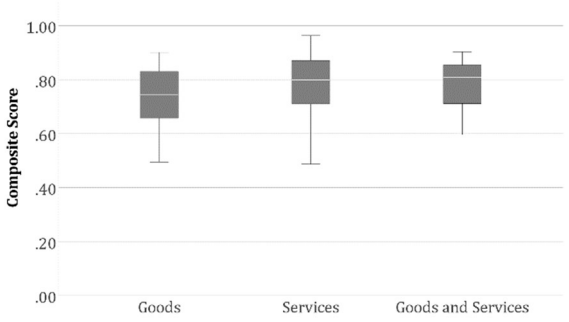
It is troublesome that sole traders, for whom this study proposes advanced skills in record keeping and revenue generation (as for microbusiness and small business respondents), display the lowest scores with these combined topics. As per the accounting cycle, there can be no financial data preparation or analysis without record keeping. No financial data preparation means that financial data cannot be incorporated into the business decision-making process. Weak skills under the topic of revenue generation indicate that the business may be unlikely to grow in revenue and size. Some sole traders have no aspiration to grow in size, but every business is likely to embrace more profit rather than less, irrespective of ultimate motivation.

7.8 Composite Financial Literacy Score

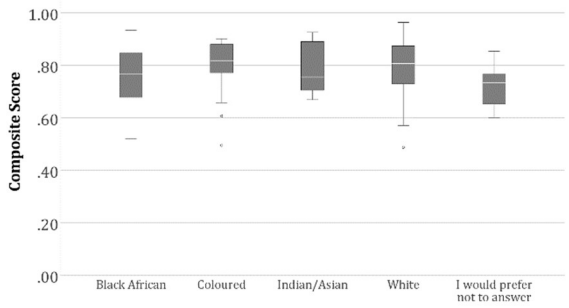
While the previous sections presented the results by dimension and topic, this section provides scores on a composite basis. The composite business financial literacy score was determined as the mean score achieved across the knowledge, behaviour, and attitude dimensions, as presented graphically in Figure 7-4. The determination of a mean score as a simple average of the dimension scores, which are simple averages of the item scores associated with each dimension, is computationally simple. As discussed in Section Financial Literacy Scoring Methodologies2.4, Lusardi and Mitchell (2007) and Leibbrandt and Nanziri (2018) used a PCA factor analysis methodology to compute a financial literacy score, while Behrman et al. (2012) and Lusardi, Mitchell and Curto (2014) undertook a two-step PRIDIT methodology for computing a comprehensive financial literacy score. These authors attempted to improve upon a simplistic methodology by weighting the items in some way to determine a composite weighted financial literacy score. However, thus far, these more sophisticated methodologies have not added additional score insights over more simplistic methods. Section 7.9 shows the results of an alternative scoring methodology considered in this study.



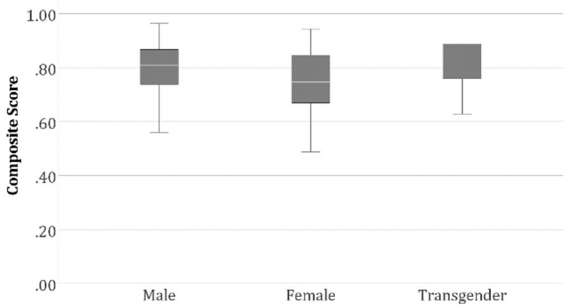
Composite scores by Enterprise Status



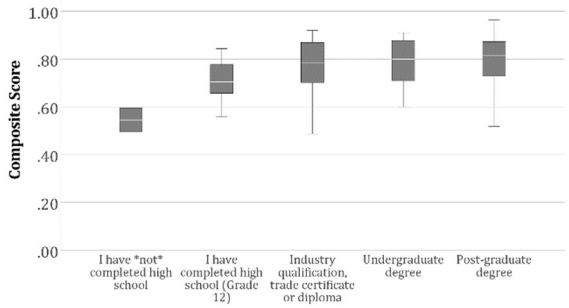
Composite scores by Business Type



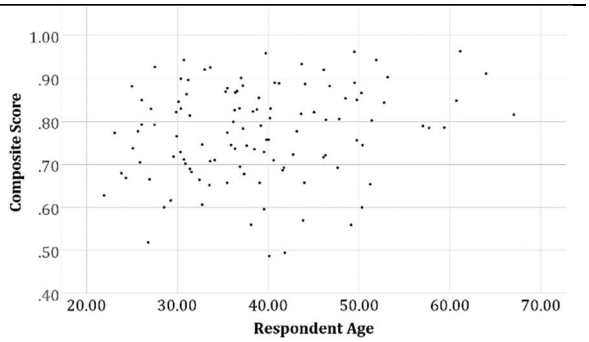
Composite scores by Race



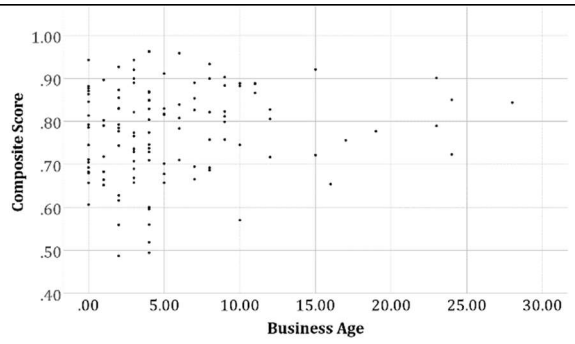
Composite scores by Gender



Composite scores by Educational Attainment



Composites scores vs Respondent Age



Composite scores vs Business Age*

** Business age axis rescaled and one small business established in 1950 not visually presented*

Figure 7-4: Composite Scores

7.9 Alternative Scoring Methodologies

Various authors have undertaken more sophisticated scoring methods, as outlined in Section 2.4.2 and Section 2.4.3. However, as noted in Section 2.4.3, although the various scoring

methods may be more computationally rigorous, the literature does not indicate sufficient advantages to justify the computational complexity. However, more complex approaches add value to assessing the reliability and validity of the individual survey items and the broader interpretation of the dataset. Lusardi and Mitchell (2007), Atkinson et al. (2007) and Leibbrandt and Nanziri (2018) all made use of eigenvectors determined from a Principal Component Analysis (PCA) to weigh financial knowledge dimension item scores. This approach was also followed as an alternative in this study to ascertain whether it materially affected the survey instrument and data sample findings.

As discussed in Section 6.2.1, factor analysis has a discretionary element to its formulation, resulting in some discretion for the researcher in selecting the component or factor number that aligns with the proposed theoretical model. One component or factor was retained in the personal financial literacy research undertaken by Lusardi and Mitchell (2007). The computed factor loadings were used as weights for each associated item to generate a financial literacy index using a Bartlett methodology to derive factor scores (Bartlett, 1937). All the RAND ALP study items could be considered knowledge dimension items; hence, the retention of one factor is appropriate.

Atkinson et al. (2007), who had five domains in total after splitting one of their four financial capability domains, managing money, into two subdomains, used a factor analysis approach to determine the scores per domain. The four financial capability domains proposed by Atkinson et al. (2007) could be considered scores per topic rather than per domain to align with the syntax used in this study.

7.9.1 Factor Weighted Score – Knowledge Dimension

Factor loadings for the thirteen knowledge items were generated using one factor and applying a principal components extraction. The factor loadings obtained were as follows:

Table 7-5: Knowledge Dimension Items - One Factor Loading

Item No	Variable Label	Component
		1
9	score_RK_Invoice	0.450
12	score_RK_VAT	-0.024
15	score_FP_IncomeStatement	0.300
16	score_FP_SmallTransaction	0.152
18	score_FP_CashFlow	0.611
20	score_FA_GPMargin	0.595
21	score_FA_ProfitvCash	0.330
22	score_BP_CapitalBudget	0.069
25	score_RG_GPMargin	0.676

27	score_RG_Breakeven	0.687
28	score_RG_FX	0.412
31	score_FSP_Dividends	0.544
32	score_REG_IncomeTax	0.152

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Replicating the approach taken by Lusardi and Mitchell (2007), the computed factor loadings were used to generate a Bartlett score for the individual knowledge items. To compare the knowledge score computed in Section 7.3, the Bartlett score (Bartlett, 1937) was normalised using a maximum-minimum scaling to take a value between zero and one.

Reviewing the factor loadings, it is noticeable that the item requiring identification and understanding of a quote versus an invoice (score_RK_VAT) carries a negative factor loading. As discussed in Section 6.2.3, this was the item that proved troublesome for small business and microbusiness respondents. Using both CTT and IRT methodology, this item was deemed most challenging and using a 2PL model under IRT, it had the least ability to discriminate.

In the computation of the knowledge score where the factor loadings weight the item responses, respondents answering this item correctly (a numerical value of one) have their overall score slightly reduced.

Despite the apparent need to revise the problematic item, this item was not excluded; the factor loadings were used as extracted to determine a factor-weighted knowledge dimension score for the respondents. Further work would benefit from a revision of this item in particular.

Table 7-6: Knowledge Dimension - Factor Weighted versus Percentage Correct Score

Enterprise Status	**Gender**	**N**	**Factor Weighted**		**Percent Correct**		**Difference**
			Mean	**Std Dev**	**Mean**	**Std Dev**	
Sole Trader	Male	9	0.59	0.29	0.65	0.22	-0.06
	Female	16	0.59	0.26	0.66	0.18	-0.06
	Trans	1	0.16		0.31		-0.15
	Total	26	0.58	0.27	0.64	0.20	-0.07
Microbusiness	Male	37	0.74	0.20	0.75	0.15	0.00
	Female	31	0.64	0.20	0.66	0.16	-0.02
	Total	68	0.70	0.21	0.71	0.16	-0.01
Small Business	Male	20	0.85	0.15	0.82	0.15	0.03
	Female	7	0.89	0.10	0.85	0.10	0.05
	Trans	2	0.85	0.00	0.85	0.00	0.00

	Total	29	0.86	0.13	0.82	0.13	0.03
Total	Male	66	0.76	0.21	0.76	0.17	0.00
	Female	54	0.66	0.23	0.68	0.17	-0.03
	Trans	3	0.62	0.40	0.67	0.31	-0.05
	Total	123	0.71	0.23	0.72	0.17	-0.01

The weighted methodology assigned lower knowledge scores to sole traders and slightly higher knowledge scores to small business respondents relative to a percentage correct score. There were no material differences between the scoring methodologies for both microbusiness respondents and the group as a composite.

7.9.2 IRT Model Score – Knowledge Dimension

Section 6.2.2.2 used both a 1PL and 2PL model to assess the item difficulty and discrimination of the knowledge dimension. A 2PL model was a better fit than the 1PL model after undertaking a Likelihood-Ratio (LR) test. Given the item difficulty and discrimination parameters, software such as STATA generates an estimate of each respondent's latent trait (knowledge score). While OECD PISA studies use a 1PL model, they present scores by assessing the latent trait determined from their 1PL model parameters (OECD, 2009a). These latent trait data are presented in logits. For comparability with the percentage correct knowledge scores computed, the logits were normalised using a maximum-minimum scaling to take a value between zero and one.

Table 7-7: Knowledge Dimension - IRT 2PL Model versus Percentage Correct Score

Enterprise Status	**Gender**	**N**	**IRT 2PL Model**		**Percent Correct**		**Difference**
			Mean	**Std Dev**	**Mean**	**Std Dev**	
Sole Trader	Male	9	0.56	0.32	0.65	0.22	-0.09
	Female	16	0.66	0.21	0.66	0.18	0.00
	Trans	1	0.48		0.31		0.18
	Total	26	0.62	0.25	0.64	0.20	-0.03
Microbusiness	Male	37	0.66	0.23	0.75	0.15	-0.08
	Female	31	0.70	0.21	0.66	0.16	0.04
	Total	68	0.68	0.22	0.71	0.16	-0.03
Small Business	Male	20	0.60	0.27	0.82	0.15	-0.21
	Female	7	0.78	0.20	0.85	0.10	-0.07
	Trans	2	0.26	0.06	0.85	0.00	-0.58
	Total	29	0.62	0.27	0.82	0.13	-0.21
Total	Male	66	0.63	0.25	0.76	0.17	-0.12
	Female	54	0.70	0.21	0.68	0.17	0.01

Trans	3	0.34	0.14	0.67	0.31	-0.33
Total	123	0.65	0.24	0.72	0.17	-0.07

The differences in the knowledge scores computed on a percentage correct basis against those computed through the latent trait estimation using a 2PL model are not insignificant. This exercise highlights the differences between classical test theory (CTT) and item response theory (IRT).

One of the primary differences between CTT and IRT is that under IRT, not all items are assumed equal in difficulty or ability to discriminate, and therefore do not carry the same "weight" in the computation of a composite score. The computationally simple percentage correct scoring methodology gives equal weight to each question.

The material score differential between the two methodologies is visible for the small business respondents, and arguably, for the male respondents in all enterprise status categories. However, male respondents (69%) dominate the small business enterprise status, suggesting that the two methodologies' score differential may be driven by gender rather than enterprise status. While Table 6-7 and Table 6-10 present the knowledge item difficulties using a CTT approach and a 1PL model, the data are not decomposed by gender. However, replicating the p-value computation as used in Table 6-7, male small business respondents performed poorly on two items: score_RK_VAT and score_FSP_Dividends (p-values of 45% and 65%, respectively). Female small business respondents had p-values of 57.1% and 85.7% for the same items.

The discrimination parameter of the 2PL model indicated that the item score_RK_VAT was problematic, and it carried the highest difficulty parameter despite not challenging sole traders as much. The item score_FSP_Dividends demonstrated a good ability to discriminate between respondents and returned a difficulty parameter of -0.16, suggesting a respondent with an average ability (latent trait theta = 0) should have an even probability of answering the item correctly. Therefore, it again appears that one item (score_RK_VAT) may be overly impacting the scores, particularly for small business respondents, leading to the difference between scores on a CTT methodology and an IRT methodology.

7.10 Revised Composite Financial Literacy Score

One of the knowledge items, score_RK_VAT, appears particularly problematic across all methods of item assessment. When assessed using an IRT 2PL model, it shows a low ability to discriminate (Table 6-11), and similarly, the item's ability to discriminate using a CTT approach was negligible (Table 6-9). Undertaking a factor-weighted scoring methodology, it displayed a negative factor loading (Table 7-5) and, as such, it was decided to drop this item from the computation of the

knowledge score and the resulting composite financial literacy score. Also impacted by the exclusion of this item was the record keeping topic score.

Ahead of the analysis discussed in Chapter 8, which assesses the demographic factors that affect business financial literacy, the knowledge dimension, record keeping, and composite scores were therefore, revised and restated.

Table 7-8: Revised Scores

	Sole Traders	**Micro-business**	**Small Business**	**Total**
Knowledge Score	0.64	0.71	0.82	0.72
Knowledge Score Revised	0.64	0.73	0.85	0.74
Record Keeping Score	0.72	0.75	0.84	0.76
Record Keeping Score Revised	0.70	0.72	0.81	0.74
Composite Score	0.71	0.76	0.87	0.78
Composite Score Revised	0.71	0.77	0.87	0.78

Given that the now excluded item was one of twenty-six items, which meant it constituted less than 4% of the total score on a simple composite score, the composite score is little affected. For the thirteen knowledge items and five record keeping items, the effect of exclusion is more impactful.

For subsequent chapters, any presentation of a business financial literacy score (dimension, topic, or composite) excludes this item. Chapter 8 uses these business financial literacy scores and the demographic data gathered from the respondents to undertake an analysis on which demographic factors influence the computed business financial literacy scores.

Chapter 8 Factors Influencing Functional Business Financial Literacy

8.1 Introduction

Many studies that focus on personal financial literacy undertake some form of analysis to assess which demographic factors play a role in influencing the level of financial literacy or certain financial behaviours. Typically, this type of research involves multiple regression analysis or multivariate analysis to assess how socioeconomic and demographic factors interact with financial literacy and associated behaviours, such as planning for retirement. The third component of this study is not intended to find a link between demographic factors and behaviours but rather assess whether any demographic factors correlate to the measured levels of business financial literacy.

The analysis described in this chapter consists of two stages. Firstly, Section 8.2 discusses the exploratory analysis undertaken to determine which (if any) demographic factors show a relationship with the measured and computed business financial literacy levels. The exploratory analysis was undertaken by an initial review of the correlation coefficients observed between the composite and dimension scores and the demographic factors. Following this, a multiple regression model was analysed, which made use of dummy variables.

The second stage of the analysis, addressed in Section 8.3, examines the comparative analysis undertaken to assess statistically significant differences between the financial literacy scores of the different demographic segments covered by this study. The comparative analysis uses two methodologies, namely a univariate and a multivariant approach.

The respondent group forms part of the exploratory study, and as such, any findings are applicable for this specific dataset and are not intended to be generalisable to the South African population as a whole.

8.2 Exploratory Analysis

8.2.1 Overview

As outlined in Section 1.6, this study has, as an objective, an analysis of the demographic factors that are correlated with business financial literacy amongst entrepreneurs. Chapter 7 visually presented this data, and Table 8-1 indicates the correlation coefficient between the demographic factors and the composite and dimension business financial literacy scores. The respondent and business age are continuous variables, while the other demographic factors (gender, race, business type and enterprise status) are categorial. The correlation matrix presents a high-level

overview of the potential relationships between the demographic factors and business financial literacy levels. While the individual demographic factors show a relatively weak correlation, some demographic factors are statistically significant.

Respondent education level and enterprise status present the strongest indication of a relationship between the composite business financial literacy score and the knowledge dimension score, while enterprise status shows a relationship with the behaviour and attitude scores. There is some evidence of a statistically significant but weak relationship between gender, respondent age and business age against composite and knowledge dimension scores. Respondent race shows some relationship with the knowledge scores but no other score. A weak relationship is observable between the business age and the behaviour scores.

Table 8-1: Correlation Coefficients[17]

	Gender	Race	Education	Business Type	Enterprise Status	Respondent Age	Business Age
N	123	123	123	123	123	115	123
Composite Score							
Pearson Correlation	-.213*	0.169	.358**	0.118	.502**	.200*	.196*
Sig. (2-tailed)	0.018	0.068	0.000	0.193	0.000	0.032	0.030
Knowledge Score							
Pearson Correlation	-.222*	0.304**	.497**	0.051	.379**	.187*	.209*
Sig. (2-tailed)	0.014	0.001	0.000	0.572	0.000	0.046	0.021
Behaviour Score							
Pearson Correlation	-0.105	0.071	0.123	0.134	.448**	0.133	.183*
Sig. (2-tailed)	0.248	0.445	0.174	0.138	0.000	0.155	0.043
Attitude Score							
Pearson Correlation	-0.149	-0.122	0.078	0.107	.322**	0.127	-0.014
Sig. (2-tailed)	0.101	0.189	0.391	0.238	0.000	0.176	0.876

** Correlation is significant at the 5% level; ** Correlation is significant at the 1% level*

[17] The respondent age and business age are continuous variables. Gender, race, education, business type and enterprise status are categorical variables.

8.2.2 Multiple Regression

Given the evidence of some relationship between demographic factors and the levels of business financial literacy measured on a composite or dimension basis, four multiple regression models were initially constructed in SPSS with, as dependent variables, the composite business financial literacy score and the three dimension scores (knowledge, behaviour, attitude), respectively. Ahead of undertaking the regression analysis, dummy variables for gender, race, education level, business type and enterprise status were created.

$$\begin{aligned} Financial\ Literacy\ Score \\ = \beta_0 + \beta_1(Gender_i) + \beta_2(Race_i) \\ + \beta_3(Education_i) + \beta_4(Business\ Type_i) \\ + \beta_5(Enterprise\ Status_i) + \beta_6(Respondent\ Age) \\ + \beta_7(Business\ Age) + \varepsilon_0 \end{aligned} \quad \textbf{(8-1)}$$

In undertaking a standard multiple regression analysis, many statistics can be reported and interpreted. For the sake of brevity in the analysis of the results, only the adjusted R2 value and the unstandardised regression coefficients and associated significance values are presented. The tolerance and variance inflation factor (VIF), as well as the normal probability plot (P-P plot) of the regression standardised residuals to assess adherence to the assumptions of the regression models, were also analysed (Rencher & Christensen, 2012; Tabachnick & Fidell, 2014). These data are found in Appendix Table E-1, Appendix Table E-2, Appendix Table E-3, Appendix Table E-4 and Appendix Figure E-1.

As the dataset's demographic variables are categorical, these were converted to binary dummy variables and a reference category was established. The reference category was selected based on data frequency: male, undergraduate degree, service provider business, microbusiness, white. The multiple regression data presented in Table 8-2 require interpretation with respect to the reference category characteristics.

To assist in interpretation, in instances where the coefficient data are statistically significant at the 5% level, the values carry an * symbol with a ** symbol indicating significance at the 1% level; assessing the composite measure of business financial literacy, relative to the reference category, respondents without tertiary education show materially lower financial literacy scores. Also evident is a lower score presented by sole traders and a higher score presented by small business respondents relative to the microbusiness reference.

Within the knowledge dimension, respondents without tertiary education perform poorly relative to the reference case. A racial difference is observable, with black respondents achieving

lower financial knowledge scores. However, post-graduate respondents achieve higher knowledge scores relative to the undergraduate reference segment.

Assessing the profile of the behaviour and attitude dimensions, small business respondents outperform in both of these dimensions, while within the behaviour dimension, sole traders underperform microbusinesses and non-high school graduates underperform undergraduate degree holders. Black respondents score more highly than the reference case respondents in the attitude dimension.

Table 8-2: Multiple Regression Models by Composite and Dimension Scores

	Composite Scores		Knowledge Scores		Behaviour Scores		Attitude Scores	
	Unstandardised Coefficients	**Sig.**	**Unstandardised Coefficients**	**Sig.**	**Unstandardised Coefficients**	**Sig.**	**Unstandardised Coefficients**	**Sig.**
Constant	0.760	0.000	0.732	0.000	0.730	0.000	0.817	0.000
Gender=Female	-0.033	0.052	-0.054	0.051	-0.026	0.306	-0.019	0.246
Education=I have *not* completed high school	-0.221**	0.001	-0.426**	0.000	-0.239*	0.017	0.002	0.969
Education=I have completed high school	-0.070*	0.024	-0.162**	0.002	-0.031	0.502	-0.017	0.555
Education=Industry qualification, trade certificate or diploma	0.006	0.801	0.024	0.534	-0.008	0.833	0.001	0.956
Education=Post-graduate degree	0.021	0.330	0.086*	0.014	-0.023	0.464	-0.001	0.948
Bus Type=My business sells goods	-0.016	0.479	0.006	0.873	-0.030	0.369	-0.023	0.278
Bus Type=My business sells goods and provides services	0.007	0.754	0.025	0.468	0.011	0.716	-0.017	0.398
Enterprise Status=Sole Trader	-0.043*	0.044	-0.052	0.137	-0.064*	0.046	-0.013	0.513
Enterprise Status=Small Business	0.078**	0.001	0.069	0.061	0.088**	0.009	0.078**	0.000
Race=Black African	-0.013	0.545	-0.072*	0.040	-0.009	0.782	0.043*	0.035
Race=Coloured	0.018	0.509	-0.043	0.334	0.061	0.140	0.036	0.159
Race=Indian/Asian	-0.037	0.358	-0.062	0.347	-0.009	0.884	-0.040	0.295
Race=I would prefer not to answer	-0.062	0.110	-0.118	0.064	-0.053	0.361	-0.014	0.697
Respondent Age	0.001	0.327	0.001	0.620	0.001	0.549	0.001	0.197
Business Age	0.000	0.845	0.002	0.362	0.001	0.764	-0.002	0.151
Adjusted R Square	0.362		0.403		0.186		0.145	

* Significant at the 5% level; ** Significant at the 1% level

It is, of course, also valuable to assess which factors were not statistically significant. As discussed in Section 2.5, gender differences are commonly observable in personal financial literacy levels, and males tend to outperform females. Income differences are prevalent (higher income levels indicate higher financial literacy levels), as are differences based on educational attainment, with more educationally qualified respondents outperforming. Various researchers have found racial or ethnic differences in select datasets. Some respondent age dependency has been found, typically represented with an inverted u-shape showing both young and old respondents with lower financial literacy levels (Bucher-Koenen & Lusardi, 2011; Fornero & Monticone, 2011; Sekita, 2011; Arrondel, Debbich & Savignac, 2013; Beckmann, 2013; Kalmi & Ruuskanen, 2018).

This dataset does not appear to present a gender difference when controlling for other factors, and similarly, there is no dependence on respondent age. Business type (service-based versus goods or hybrid) is not a factor. Like other studies, education attainment is observable as a factor influencing business financial literacy scores, and there is a slight racial discrepancy in the knowledge and attitude scores observable.

While these data are presented relative to the reference case, is it difficult to determine the level and statistical significance of score differentials between the various groups. Group comparison is helpful is to assess the differences on a more granular basis.

8.3 Group Comparison

Comparison between groups can take one of two forms from a statistical analysis perspective. In this study, each dependent variable (the various financial literacy scores) can be treated separately and the demographic factors (and potential relationships between the demographic factors) influencing those individual scores analysed. Alternatively, the financial literacy dimension scores can be considered a composite dependent variable (multiple dependent variables simultaneously) and analysis undertaken to determine those demographic factors that influence the multiple dependent variables simultaneously.

Treating each dependent variable individually requires univariate analysis of variance methodology (ANOVA), while assessing the dependent variables simultaneously requires multivariate or multiple analysis of variance methodology (MANOVA). ANOVA is not dissimilar to the multiple regression output obtained in Table 8-2 but allows more granular intra-group analysis and observation. Also, while, for example, a gender difference might be observable in the scores, ANOVA methodology allows for a better understanding of whether gender is the primary driver or whether when other demographic factors are included, the gender disparity persists.

8.3.1 Univariate Analysis

The first step undertaken was to run four separate univariate general linear models (ANOVA) in SPSS with the demographic factors (gender, race, prior education, respondent age, business type, enterprise status, business age) as independent variables. The composite business financial literacy score, financial knowledge score, financial behaviour score and financial attitude score were the four dependent variables. No interaction terms were included, as the objective was to determine the main effects. Model building in this way is an iterative process, and there is subjectivity in the decisions of independent factors to include and exclude.

All four univariate models included all demographic factors; the respondent business type and respondent and business age were found to be non-significant (*p-value* > 5%). In the composite financial literacy score model, the educational level and the enterprise status were significant (*p-value* < 5%). In the knowledge dimension, gender and educational level were significant; in the behaviour dimension, enterprise status was significant, and in the attitude dimension, race and enterprise status were significant.

After this preliminary step, those factors non-significant across all models were removed, leaving gender, race, educational level and enterprise status as the independent variables.

After removing the non-significant factors, enterprise status was found to be significant across all four models. The composite and knowledge models also displayed educational level as a significant variable, while race accompanied enterprise status in the attitude model. Enterprise status was the only significant variable in the behaviour dimension model.

The results after this second stage are interesting in that gender was non-significant in all models. These results suggest that gender is not a key determining characteristic in business financial literacy levels after accounting for other factors as measured in this study. While gender was a non-significant variable by itself, when removed from the models, the model fit measured by an adjusted R squared value slightly decreased for the composite and knowledge models and slightly improved for the behaviour and attitude models. As such, it was decided to retain gender and race in the models due to the desire to find a set of factors applicable to the composite and dimension scores rather than cherry-picking factors per dimension.

The univariate analysis results uncovered that educational attainment and enterprise status were key determinates in the various financial literacy scores. The knowledge score is graphically depicted in Figure 8-1.

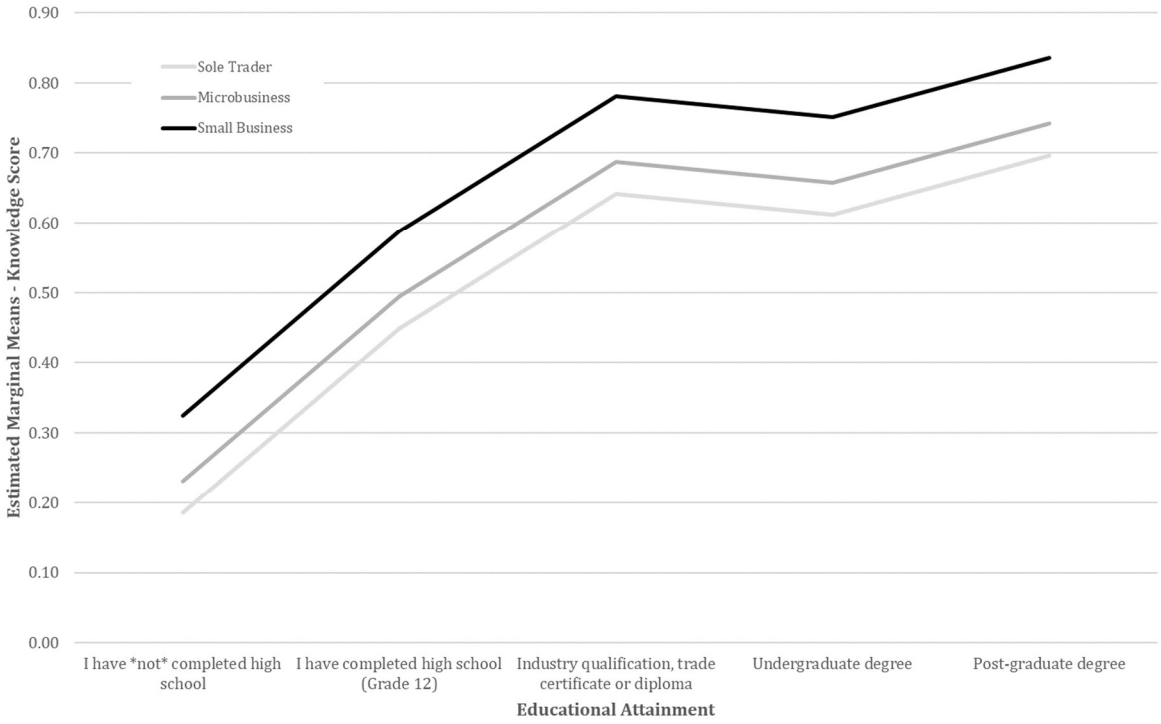


Figure 8-1: Financial Knowledge Scores by Education Level and Enterprise Status

A Tukey's honest significant difference test (HSD) is a post-hoc statistical test conducted to determine which group mean scores differ from each other (Salkind, 2012). Therefore, Tukey's HSD was used to determine the extent of the score differences between the various enterprise status and educational attainment groups for the composite and knowledge scores and the differences between enterprise status groups for the behaviour and attitude scores.

The results for the various Tukey HSD post-hoc tests are available in 0. The following commentary pertains to score differentials significant at the 5% level.

All respondents with a tertiary education outperform respondents with a high-school or lower educational attainment level on a composite and knowledge dimension level. The differentials are significant. For example, Appendix Table E-6 presents the statistically significant mean differences in the knowledge dimension scores between respondents with varying educational attainment levels. Industry qualified respondents have a mean knowledge dimension score of 0.73, while high school qualified respondents have a mean knowledge dimension score of 0.55. Undergraduate degree holders score 0.72, and post-graduate degree holders score 0.82 on a mean basis for their respective groups.

Thus, statistically significant at the 5% level, industry qualified respondents out-score high-school respondents by 16.6%, undergraduate degree respondents outperform high-school

respondents by 15.8%, and post-graduate degree respondents outperform high-school respondents by 25.7%. Education beyond high school is critical from a financial knowledge perspective within this sample group.

When the composite business financial literacy scores are assessed, there are no differences in scores between the tertiary education categories (industry qualification, undergraduate degree, post-graduate degree). However, the post-graduate respondents outperform the undergraduate respondents in the knowledge dimension by 9.91%. In subsequent studies, it would be valuable to interrogate what subjects the university graduates majored in to determine whether specific tertiary knowledge is additive to financial knowledge.

Small business respondents outperform microbusiness and sole trader respondents across all score measures (composite, knowledge, behaviour, attitude). Microbusiness respondents outperform sole traders in all categories except attitude, where the score differential is not statistically significant. The differentials are material; small business respondents have a higher composite score of 9.6% and 16.1% against microbusinesses and sole traders, respectively.

Multivariate analysis was next undertaken to assess whether these findings hold in the multiple dependent variable cases.

8.3.2 Multivariate Analysis

To evaluate whether there are differences in the dimension scores of different demographic groups, a one-way multivariate analysis of variance (MANOVA) was undertaken. MANOVA is a helpful approach when the dependent variables (knowledge score, behaviour score, attitude score) are correlated (Rencher & Christensen, 2012). Similarly to the univariate approach in Section 8.3.1, a model with all demographic factors was formulated, following which non-significant factors were excluded.

The findings on a multivariate basis were very similar to the univariate case. This study's primary influencing factors for business financial literacy scores were enterprise status and educational attainment level. Gender, race, respondent age, business age or business type were not found to be significant.

A different basket of dependent variables was then applied to the multivariate model. Composite financial literacy has been presented as the combination of dimension scores but could also be conceptualised as the composite of the topic scores. A model in which the topic scores (record keeping, financial data preparation, financial data analysis, budgeting and planning, revenue generation, financial service providers, financial regulations) were included as the basket of

dependent variables was analysed against the independent variables (gender, race, education level, enterprise status and the interaction between race and education level).

Tukey HSD post-hoc analysis of the differences between respondents of different education levels did not present a uniformly statistically significant pattern across the different topics. However, small business respondents again outperformed microbusiness and sole trader respondents when assessing the differences by enterprise status. The results are available in Table 8-3 below.

Table 8-3: Topic Scores - Tukey Post-Hoc Test Enterprise Status

Topic Score	(I) Enterprise Status	(J) Enterprise Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Record Keeping	Sole Trader	Microbusiness	-0.0219	0.038	0.833	-0.112	0.069
		Small Business	-.1124*	0.044	0.034	-0.218	-0.007
	Microbusiness	Sole Trader	0.0219	0.038	0.833	-0.069	0.112
		Small Business	-.0905*	0.037	0.043	-0.179	-0.002
	Small Business	Sole Trader	.1124*	0.044	0.034	0.007	0.218
		Microbusiness	.0905*	0.037	0.043	0.002	0.179
Financial Data Preparation	Sole Trader	Microbusiness	-0.0422	0.037	0.497	-0.131	0.047
		Small Business	-.1651*	0.044	0.001	-0.269	-0.061
	Microbusiness	Sole Trader	0.0422	0.037	0.497	-0.047	0.131
		Small Business	-.1229*	0.036	0.003	-0.209	-0.036
	Small Business	Sole Trader	.1651*	0.044	0.001	0.061	0.269
		Microbusiness	.1229*	0.036	0.003	0.036	0.209
Financial Data Analysis	Sole Trader	Microbusiness	-0.0834	0.057	0.312	-0.219	0.052
		Small Business	-.1839*	0.066	0.019	-0.342	-0.026
	Microbusiness	Sole Trader	0.0834	0.057	0.312	-0.052	0.219
		Small Business	-0.1005	0.055	0.171	-0.233	0.031
	Small Business	Sole Trader	.1839*	0.066	0.019	0.026	0.342
		Microbusiness	0.1005	0.055	0.171	-0.031	0.233
Budgeting & Planning	Sole Trader	Microbusiness	0.0046	0.035	0.991	-0.080	0.089
		Small Business	0.0159	0.041	0.921	-0.082	0.114
	Microbusiness	Sole Trader	-0.0046	0.035	0.991	-0.089	0.080
		Small Business	0.0114	0.034	0.942	-0.071	0.093
	Small Business	Sole Trader	-0.0159	0.041	0.921	-0.114	0.082
		Microbusiness	-0.0114	0.034	0.942	-0.093	0.071
Revenue Generation	Sole Trader	Microbusiness	-.1516*	0.038	0.000	-0.243	-0.060
		Small Business	-.2897*	0.045	0.000	-0.396	-0.183
	Microbusiness	Sole Trader	.1516*	0.038	0.000	0.060	0.243

Topic Score	(I) Enterprise Status	(J) Enterprise Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
		Small Business	-.1381*	0.037	0.001	-0.227	-0.049
	Small Business	Sole Trader	.2897*	0.04474	0.000	0.1832	0.3962
		Microbusiness	.1381*	0.03731	0.001	0.0493	0.2269
Engaging with FSPs	Sole Trader	Microbusiness	-0.0642	0.06044	0.540	-0.2081	0.0797
		Small Business	-.1948*	0.07062	0.019	-0.3629	-0.0267
	Microbusiness	Sole Trader	0.0642	0.06044	0.540	-0.0797	0.2081
		Small Business	-0.1306	0.05890	0.073	-0.2708	0.0097
	Small Business	Sole Trader	.1948*	0.07062	0.019	0.0267	0.3629
		Microbusiness	0.1306	0.05890	0.073	-0.0097	0.2708
Engaging with Regulators	Sole Trader	Microbusiness	-0.0335	0.03603	0.624	-0.1192	0.0523
		Small Business	-.1295*	0.04209	0.008	-0.2297	-0.0293
	Microbusiness	Sole Trader	0.0335	0.03603	0.624	-0.0523	0.1192
		Small Business	-.0960*	0.03510	0.020	-0.1796	-0.0125
	Small Business	Sole Trader	.1295*	0.04209	0.008	0.0293	0.2297
		Microbusiness	.0960*	0.03510	0.020	0.0125	0.1796

Based on observed means.
The error term is Mean Square(Error) = .024
**. The mean difference is significant at the .05 level.*

Small business respondents outperformed both microbusiness and sole traders in the record keeping, financial data preparation, revenue generation and regulation topics. Small business respondents outperformed sole traders, but not microbusiness respondents, within financial service providers and financial data analysis topics.

There were no statistically significant score differentials between the various enterprise status classifications in the budgeting and planning topic. Under revenue generation, microbusiness respondents outperformed sole traders. There were no other statistically significant topic score differentials between microbusiness and sole trader respondents.

8.4 Commentary on the Results

The analysis of how demographic characteristics affect business financial literacy levels has not been previously undertaken, and this new work has uncovered some insightful relationships. Irrespective of how the analysis was undertaken, whether a standard linear regression model or univariate or multivariate analysis, the results indicate that enterprise status and educational attainment level are the primary factors positively correlated with the various financial literacy scores.

Educational attainment is an easy explanatory factor to justify; more education leads to more knowledge, represented in a higher score. This study confirms results found in almost all global personal financial literacy studies. Within a South African context, the results found by Peters and Brijlal (2011) and Preisendörfer, Bezuidenhout and Bitz (2012) are confirmed; higher levels of educational attainment are related to higher levels of financial literacy. Similarly, Leibbrandt and Nanziri (2018) found that South African university graduates had higher personal financial literacy levels than those with a high school (or lower) level of attainment.

However, what is interesting is that while there are some differences in the scores amongst the tertiary education categories (industry qualification, undergraduate degree, post-graduate degree), the more significant score differential is between tertiary or non-tertiary educated respondents. To enhance business financial literacy amongst individuals who wish to start a business or are running a business but do not have tertiary education, an appropriate level of educational support should be provided.

Understanding the difference between enterprise status categories and business financial literacy score is a more complex task. There is no material business age or respondent age difference between the different enterprise status categories in this exploratory data sample, so the justification of “survival bias” or experiential learning would seem not to apply.

The proposed financial competencies framework in Section 3.4.7 suggested that respondents of different enterprise statuses required a different level of skill for the topics included in the conceptual framework of financial literacy. Given the different skill requirements as proposed, perhaps this is justification for the different scores presented. In other words, sole traders do not need as high a level of financial literacy as microbusiness or small business respondents, in which case, just because the sole traders have indicated a lower financial literacy score, it does not mean they are not financially literate. Perhaps their level of financial literacy is appropriate for their enterprise status.

The recommendation of differing skill levels introduces a further complexity, and that is the threshold between being deemed financially literate or not. The OECD/INFE global survey instrument suggests a minimum financial literacy score of 70% within the knowledge dimension (OECD, 2016a). However, despite 70% being adopted as the threshold, no authors have justified 70% as appropriate. Therefore, this threshold level seems quite arbitrary and not necessarily linked to any objective, practical requirement for business success.

However, while acknowledging the somewhat subjective nature of the 70% as a threshold level, applying it as a threshold to this study would suggest that the sole traders in this study are not financially literate, as their revised knowledge score was 68% (see Table 7-8). Table 7-3 displays the composite mean scores by topic for the various enterprise status classifications, and these scores also suggest that sole traders are not financially literate.

However, the sole traders' mean business age is 3.62 years (see Table 7-1), implying they survive despite their lower scores. Further work in which longitudinal case studies are analysed would help confirm whether different enterprise statuses require different skill levels across the financial competencies.

An important finding from this study is that gender is not a primary driver of financial literacy scores once accounting for other factors. As discussed in Section 2.5.2.1, personal financial literacy studies find a significant gender difference. Perhaps this study's lack of difference in scores amongst the genders captures some inherent trait differences among individuals who choose to embark on an entrepreneurial path. Again, further research is required to incorporate testing between entrepreneurs and salaried employees with similar demographic characteristics to uncover these differences.

Chapter 9 Conclusion

9.1 Overview

The academic field of business financial literacy is new; however, as a context-specific component resting above the financial literacy domain, it is a critical one. Entrepreneurs are vital for economic growth and job creation, and yet, the likelihood of business success (or survival) is low. It is imperative that entrepreneurs are equipped with the necessary financial competencies to enhance the probability of business success. Those financial competencies need to be practically grounded, in other words, functional. A common approach to financial or accounting-related education and training within entrepreneurial programmes focuses on theory, not on the "bare-bones basics" that are important in daily business operations.

For instance, record keeping is foundational as part of the accounting cycle, and yet, it is an area of weakness for many respondents. Without record keeping, there can be no financial data preparation or analysis, no budgeting and planning. A component of revenue generation is correctly pricing goods and services, and, without business financial data, the process of appropriately pricing goods and services is impossible.

A lack of business capital is often cited as a reason for business failure. Business capital providers are a form of financial services providers, and they require entrepreneurs to present financial data as part of their due diligence process ahead of providing capital. An entrepreneur without the competencies to "speak the language" of accounting and present their business's financial position is highly unlikely to be awarded some form of business capital.

Without measuring business financial literacy and understanding the demographic factors that affect the business financial literacy levels, appropriate support and intervention are challenging.

9.2 Review of Research Objectives

As outlined in Section 1.5, this study had three primary objectives:

- The formulation of a theoretical financial competencies framework for business practitioners is covered in Chapter 3.
- The construction of a survey instrument to measure the business financial literacy of entrepreneurs is covered in Chapter 4, Chapter 5 and Chapter 6.
- An exploratory study of the business financial literacy of a convenience sample of entrepreneurs and the associated demographic factors, the results of which were presented in Chapter 7 and Chapter 8.

A theoretical financial competencies framework grounded in the accounting cycle and incorporating Bloom's educational taxonomies was developed as the first step in meeting the above objectives. In so doing, the practical financial competencies for entrepreneurs in businesses of different sizes (enterprise status) was established. The use of the accounting cycle and a focus on record keeping and financial data preparation, tasks that could be perceived as more "grassroots" type competencies, are undoubtedly more mundane than securing mezzanine financing or undertaking an ICO (initial coin offering). However, in both the developed and developing worlds, business practitioners need to be equipped with the practical competencies for tasks they are likely to perform daily, rather than for higher-order, niche activities, such as sophisticated financing options.

The financial competencies framework was used as the foundation for designing and developing a survey instrument incorporating the financial knowledge, behaviour, and attitude dimensions from the OECD/INFE, which was subjected to various reliability and validity tests and improvements. The survey adhered to a Flesch Kincaid Reading Ease score, expert input was utilised in the construction process, a pilot study was undertaken, and an empirical analysis was conducted to assess the construct validity (factor analysis), the reliability (Cronbach's alpha) and the difficulty of the items, and the ability of the items to discriminate based on respondent ability (CTT and IRT analysis).

A survey administration in which 123 convenience respondents, comprising a mix of sole trader, microbusiness, and small business respondents, completed the survey allowed for an investigation of the demographic characteristics correlated with business financial literacy levels.

9.3 Summary of Findings & Contribution to Research

As no prior studies sought to assess the demographic characteristics that affect business financial literacy, it is not possible to compare the findings of this study with others. However, this study's results can be compared with work conducted in the field of personal financial literacy. Academic studies in the personal financial literacy field find gender, age, income level and educational attainment to be key characteristics that influence personal financial literacy levels or associated personal financial behaviours.

A key difference between the findings of this study and the personal financial literature is that, in contrast to the latter, this study finds that neither gender nor race is correlated to the level of business financial literacy when other demographic factors are considered. Instead, in this study, the primary explanatory characteristics of business financial literacy levels were found to be educational attainment and business size (enterprise status).

Sole traders, in particular, showed lower competencies relative to larger enterprises (microbusinesses and small businesses) despite requiring an equivalent level of skill in specific topics. Respondents without tertiary education, irrespective of the nature of that tertiary education, also displayed materially lower business financial literacy levels. These are significant findings within the context of providing education, support and intervention for entrepreneurs to enhance the probability of business success. Education and training programmes should carefully curate their offering to cater to these "in need" groups.

A finding applicable to all respondents was weakness in the topic of engaging with financial service providers. This measured weakness is troublesome when the role that financial services providers play for entrepreneurial businesses is considered. Entrepreneurs, irrespective of business size, should be banked and should have some mechanism to separate personal finances from business finances. Entrepreneurs who aspire to grow their business may need external capital in the form of equity or debt financing. Part of that financing process will include presenting current or prospective financial position to the financial services financier. An entrepreneur without the competencies to prepare and present their financial position will not meet the due diligence requirements and therefore suffer from a lack of financing or higher cost financing as the business is assessed to be more financially opaque and therefore riskier.

The study's main contributions are in conceptualising a framework for assessing the business financial literacy of entrepreneurs, including self-employed individuals, designing a flexible instrument for this purpose, and demonstrating the instrument's application in an initial exploratory assessment. As the application of the instrument, which focuses on the correlation of selected demographic factors with business financial literacy, is based on a convenience sample, the study's contribution is not primarily of an empirical nature. Instead, it provides a foundation for further planned empirical studies and related questions based on larger and more representative samples.

Equipping entrepreneurs with the appropriate functional business financial literacy skills and competencies is critical, and there is a tremendous economic and societal benefit from encouraging and supporting entrepreneurial ventures.

9.4 Limitations of the Research

All research has certain limitations inherent in its design. There are numerous limitations to this research work, some of which set up opportunities for future research. From an empirical data perspective, the pilot group was very small, which creates statistical analysis challenges and means that quantitative results should be reviewed as "informative" but not necessarily statistically robust.

The full respondent group was not representative of the South African population (nor was it intended to be), and the respondents were sourced on a targeted non-probability basis. No information about the respondents' industry, geographical area or prior accounting-specific knowledge was captured. As such, no general opinions about the functional business financial literacy level can be inferred from the respondent group.

However, despite the convenience sample not being representative of the South African population, the data gathered is potentially useful for future research. In many respects, the sample of 123 responses can be viewed as a pilot study from which a future reliable and valid business financial literacy survey instrument can be produced. Certain items require revision, and the convenience sample dataset provides input into those items which need further consideration.

From a commercial perspective, an instrument that has the potential to establish a relationship between the entrepreneurs' financial literacy levels and the likelihood of business success would be valuable. This research work did not examine the relationship between the business financial position and the respondents' level of business financial literacy.

The results of a functional business financial literacy survey instrument could also prove valuable to providers of entrepreneurial education. This research did not seek to evaluate entrepreneurial training programmes or draw any conclusions about the effectiveness of such programmes.

The limitations of this research suggest potential avenues for future research.

9.5 Recommendations for Future Research

Business financial literacy is a new context-specific component of the broader financial literacy domain, and it is hoped that this study serves as a catalyst for a myriad of further work. Using the theoretical financial competencies framework as the foundation, the items included in this survey instrument are useable (subject to some revision in places) for a more extensive national (South African) or cross-country comparative study. A broader administration would allow for further exploration of the demographic characteristics that affect business financial literacy levels.

While the ethical considerations of respondent anonymity bounded this study, a subsequent study, that included case study interviews with respondents to interrogate their operational and strategic financial behaviours and decision-making processes, and their attitude towards these tasks, would provide valuable additional insights on the relationship between the three business financial literacy dimensions, namely knowledge, behaviour, and attitude.

Associated with a case study approach would be assessing and analysing a business's financial position through the use of financial ratios to assess whether there is a relationship between business financial literacy levels and business financial performance.

One of the overarching long-term objectives of this study was to find mechanisms to better support entrepreneurs, and a survey instrument provides the ability to measure the impact of such interventions via a "before and after" approach. Equally, those institutions providing support and training for entrepreneurs could use the theoretical financial competencies framework as a foundation for creating and curating their curriculum materials and assessing the impact of their training.

These are a few of the research strands that could be followed; however, there are many opportunities to add academic richness and depth to the field of business financial literacy.

9.6 Concluding Remarks

This study incorporated research and concepts from literacy, financial literacy and the context-specific area of personal financial literacy, accounting, business management and education. It is an unusual blend of topics and arguably includes psychology elements to address the behaviour and attitude dimensions.

The researcher has (a love of) and first-hand experience in training and educating entrepreneurs. This education process allowed for the observation of common challenges faced by entrepreneurs, and these were empirically echoed through the administration of the business financial literacy survey instrument. Too often, entrepreneurs are unsure which business financial tasks they should conduct every day, or perhaps, they are unaware of the broader implications of not staying on top of their accounting processes. The researcher has seen businesses that do not adequately record keep and are, therefore, unsure of their financial position. Businesses that cannot correctly price their goods and services because they do not have a clear view of their overheads, or businesses that seem unaware of a changing economic environment, are caught "wrong-footed".

It is distressing to witness a good business concept fail, not because the entrepreneur has not worked long and hard or that the anticipated customer demand did not come to fruition, but because poor or impulsive financial decisions were taken. These questionable decisions are often not made because entrepreneurs are reckless risk-takers but because they "do not know what they do not know". Furthermore, this is why the training approach of presenting accounting *theory* is flawed. Accounting theory is critical for those intending to become accountants, but it does not equip entrepreneurs with the required practical knowledge and skills. Theory-heavy material also dissuades learning because it is too technical and lacks practicalities.

In conclusion, through this study, the researcher has followed a path of great personal interest and passion and intends to build upon this thesis to understand business financial literacy better and use this understanding as a foundation for better supporting entrepreneurs of all types. It is further hoped that establishing a framework and survey instrument for the measurement of functional business financial literacy will serve as an enabling framework for the development of interventions to improve the skills of entrepreneurs in this regard.

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Appendices

Appendix A. Expert Group Input

Appendix Table A-1:Expert Group CVI Results

Topic	Version Item Text	Statement 1 Item CVI	Statement 2 Item CVI	Flags
C. RECORD KEEPING	You own a business called ABC Trading. Which transaction has occurred if you have the following business document?	1.00	0.60	x
	Business documents must be kept in paper form.	0.60	0.60	xx
	How often do you personally check that your business documents are stored and saved correctly?	0.80	0.60	x
	You have this quote from a supplier. Your business is registered for VAT. You can use this document to claim R2,064 in VAT.	0.80	0.60	x
	Assess the statement. Making sure your business documents are stored and saved correctly is critical to the success of your business.	0.60	0.60	xx
	Scale CVI	**0.76**	**0.60**	**xx**
D. FINANCIAL DATA PREPARATION	How often do you review your business profits or losses?	1.00	0.80	
	The income statement shows which one of the following?	0.80	0.80	
	A bank transaction fee of R0.83 should be recorded as part of your business accounts.	1.00	0.80	
	How often do you borrow money from the business petty cash to pay for personal expenses?	0.40	0.80	x
	The following is a sample of a business cash flow statement. What is the net cash flow for the business?	1.00	0.80	
	Scale CVI	**0.84**	**0.80**	
E. FINANCIAL DATA ANALYSIS	Assess the statement. I am confident that I have the skills needed to analyse my business finances.	1.00	0.80	
	Make use of the information below. Calculate the gross profit margin.	1.00	0.80	
	It is possible for my business to make profits but run out of cash.	1.00	0.80	
	Scale CVI	**1.00**	**0.80**	

Topic	Version Item Text	Statement 1 Item CVI	Statement 2 Item CVI	Flags
F. BUDGETING & PLANNING	How often do you think about what your business would do if it ran out of cash?	1.00	0.80	
	A new machine costs R50,000 and can be used for 5 years after which it is no longer usable. The machine allows your business to make cash profits of R7,000 per year. Buying the machine is a good business decision.	1.00	1.00	
	Assess the statement. It is okay for your business to spend more than budgeted on expenses.	0.80	0.80	
	Scale CVI	**0.93**	**0.87**	
G. REVENUE GENERATION	To increase the gross margin of your business, what step can you take?	0.80	0.80	
	Do you include your time cost when estimating what it costs your business to generate revenue?	0.40	0.40	xx
	Using the financial data below: how many items do you need to sell each month to pay for your monthly overheads?	1.00	0.80	
	Your business sells goods and services to an overseas market, and your local currency strengthens. Your local currency revenue will increase.	0.80	0.80	
	Your business functions within a bigger market. How often do you read, watch or listen to information about that market?	0.80	0.60	x
	Scale CVI	**0.76**	**0.68**	**xx**
H. ENGAGING WITH FSPS	When you sign up for a new financial product (bank account/insurance policy/loan), you read all of the legal "fine print".	1.00	0.80	
	The financial data below shows how your business is financed. If you want to pay the founding team a dividend of R5 per share, how much do you need to pay the other business financiers?	1.00	0.80	
	Scale CVI	**1.00**	**0.80**	
I. ENGAGING WITH REGS & REGULATIONS	If your business makes a profit then income tax will need to be paid to the tax authority.	1.00	0.80	
	Assess the statement. If the directors of a business make reckless decisions, then they should be punished.	0.80	0.80	
	Once each year, your business produces financial statements.	0.80	0.80	
	Scale CVI	**0.87**	**0.80**	
ALL	**Scale CVI**	**0.85**	**0.75**	**x**

Appendix Table A-2: Expert Group Open-Ended Question Commentary

Topic	Version 1 Item Text	Comments
C. RECORD KEEPING	You own a business called ABC Trading. Which transaction has occurred if you have the following business document?	• "The fact that a respondent knows what this document is - has zero bearing on their record keeping - it is merely a recognition of a document."
	Business documents must be kept in paper form.	• "Could you be more specific and say 'Financial' business documents - or perhaps: A paper record of all financial business documents must be kept." • "If the respondent is on ZERO - then it is NOT in paper form. If they have an "old style" bookkeeper - then it will be on paper. Neither of which are answered by this question - it is highly ambiguous; also - the record keeping has nothing to do with this question."
	How often do you personally check that your business documents are stored and saved correctly?	• "Is there scope to ask, in the event they perhaps outsource record keeping internally or externally, how often business documents are stored and saved, and then how often they as the business owner personally checks these. i.e. the questionnaire respondent may save they don't check, but someone else in the business may be doing it." • "Most SMMEs do not check these "business documents" - ever - except when the bank asks for some information. Also - what exactly does "business documents " mean? Even I do not know what you mean. :-)"
	You have this quote from a supplier. Your business is registered for VAT. You can use this document to claim R2,064 in VAT.	• "The SMME will assume that the quote is accepted - as is standard practice. Therefore - they will answer - Yes. It also has zero reference to their knowledge or actual record keeping ability in this question."
	Assess the statement. Making sure your business documents are stored and saved correctly is critical to the success of your business.	• "What business documents? What do you mean by success? Does this refer to general business documents and success relates to, for example, efficiency, or are these debtors and receivables and relates to financial administration?"

Topic	Version 1 Item Text	Comments
		• "If you have no sales - then all the record keeping of "business documents" is irrelevant to the success of the business. The question should read more like "contributes to the success" or could assist in making your business move closer to best business practice."
FINANCIAL DATA PREPARATION	How often do you borrow money from the business petty cash to pay for personal expenses?	• "I find this question a bit unsatisfactory, as I cannot get a good feel for what the average between "never" and "always" is. To me, the rating scale is too subjective. I would rather go "Never", "daily", "weekly", "monthly" etc." • "Perhaps just refer to "money from the business"." • "Are you able to include some kind of scale or other measure, i.e. does always mean once a week, every day - this may mean different things to different people. Could you perhaps give a scale - never, once a week, once a month, only in emergencies etc." • "This is very murky when it comes to an SMME. It does, however, test their knowledge. It is a test of "integrity" so, therefore, is unlikely to be answered truthfully - as often they think "it is my business " so I am entitled to do this." • "The question should focus more on the recording of the borrowing of petty cash. As it stands, the question is testing the behaviour."

Topic	Version 1 Item Text	Comments
G. REVENUE GENERATION	Do you include your time cost when estimating what it costs your business to generate revenue?	• "Suggested rephrase: Do you include the cost of your time when estimating all the product or service costs involved in generating revenue for your business." • "This question has little or no value to add to the discussion on "generating revenue. It has a lot to do with generating profits but NOT revenue."
	Your business functions within a bigger market. How often do you read, watch or listen to information about that market?	• "What do you mean by a bigger market? Could you clarify?" • "This has little to do with "penetrating" a market and everything to do with "Research of a market" Research is not "generating revenue."

Appendix Table A-3: General Comments from Expert Group

Question 1	Question 2	Question 3
I thought it was comprehensive!	Understanding interest rates, debt management, cash runway	Great survey!

Question 1	Question 2	Question 3
Good range of topics, it may also be interesting to know their levels of financial literacy - i.e. did they do accounting at school, post-matric, take some online courses? Where do they get their financial advice, support from? Do they outsource finances/record keeping or use any online tools to help them (which ones?). Is this research interested in delving deeper into tax? May then be interesting to know what kind of entity they are registered as, are they registered for tax (this may be sensitive unless its anonymous but would be interesting). Perhaps also in addition to the last question "what does the term business finances mean to you?" (could you put this upfront) could you also ask "how much are your business finances a priority for you" - they scare me so I put them off, I know they're essential so I prioritise every week, I make the effort when I need to report for funders etc. etc. - would be interesting to then for example link their financial education to how much they assign time to their finances (and if they do the finances themselves)	See comments above	Important work - thanks for doing this!
I believe an introduction in the beginning - to formalise the process and exercise the Respondents thoughts - is in order. Some questions are a "If I answer - I show that I do not know" or If I answer - I show that I am not complying" is a real issue. You are after all - dealing with entrepreneurs - the people who are in business to sail as close to the wind as possible - and sometimes passed that line - knowingly or not.	I guess your "expected outcomes" are the answer. If they comply with your hypothesis and questions - then it is in order. I believe that this needs to be more pragmatic and realist.	A great start - but I think it needs further practical input - with the end in mind.
All seven are valid topics and I can think of no other topics which should be included.	No	None

Appendix Table A-4: Item Revision Following Expert Group Feedback

Topic	Original Item Text	Revised Item Text	Commentary
C. RECORD KEEPING	You own a business called ABC Trading. Which transaction has occurred if you have the following business document?	No revision	Table 4-3 identifies this item as: "Analyse: Can the respondent distinguish between different business source documents?" Without the ability to recognise source documents, it is not possible to correctly store and save the document itself, undertake any financial data preparation or subsequent analysis. The feedback from the expert group suggested this item was about document recognition which they did not equate with the skill of record keeping. However, the comment from a member of the expert group confirmed that the intended item objective "document identification" was met. Given that the researcher believes that document recognition is the first step in successful records management, there is the retention of the original item format.
	Business documents must be kept in paper form.	You need to show someone a financial business document *within the next hour* from a transaction that took place three months ago. If it is not a bank statement that is needed, how hard or easy would it be for you to find the document in time?	This item has been entirely amended and now tests record keeping behaviour rather than knowledge. The ease with which a respondent can timeously "find" a historical record will provide indirect evidence of whether they are systematically classifying, and storing their financial source documents. The item also assesses their ability to retrieve a source document which is a component of record keeping.

Topic	Original Item Text	Revised Item Text	Commentary
	How often do you personally check that your business documents are stored and saved correctly?	How often does someone store and capture your business financial transactions?	The amended item allows for a situation where the respondent does not personally carry out the storage or verification process or the case where that function is conducted outside of the business by an external provider. It introduces the ability to assess the human resources (internal or external) allocated to record keeping and therefore, the deemed importance of the record keeping task to the business.
	You have this quote from a supplier. Your business is registered for VAT. You can use this document to claim R2,064 in VAT.	You have this quote from a supplier. Your business is registered for VAT. You can use this document to claim back R2,064 in VAT.	The item text underwent a minor revision to enhance clarity. The researcher decided to retain this item largely unchanged as Table 4-3 identifies this as: "Analyse & Evaluate: Can the respondent distinguish between different business source documents and justify the resulting financial decision?" The ability to correctly identify, classify, interpret and act on business source documents are the foundations of record keeping and the accounting process. The researcher also has the first-hand experience of business financial decision-makers incorrectly using quotes rather than invoices in the financial decision-making process.
	Assess the statement. Making sure your business documents are stored and saved correctly is critical to the success of your business.	Assess the following statement. Making sure your business documents are stored and saved correctly adds to the success of your business.	This attitude-based item underwent a slight amendment to suggest that record keeping "adds to" the success of the business.

Topic	Original Item Text	Revised Item Text	Commentary
D. FINANCIAL DATA PREPARATION	How often do you borrow money from the business petty cash to pay for personal expenses?	Assess the following statement. It is acceptable for the business owner to use the business petty cash (banknotes and coins) to pay for personal expenses.	An important issue raised by one of the expert group members in reviewing the original item text was the concept of integrity, and that many business owners would believe that as it is "their" business, they are entitled to this behaviour. This notion that the business assets are the personal property of the small business owner captures some of the researcher's motivation for the inclusion of this item. The researcher is aware of multiple businesses where the business petty cash is used to fund personal expenses or is used to fund business expenses, or both but not correctly recorded in either instance. However, given the sense of discomfort such a question might present for a respondent, the researcher amended the item text to be less test of personal behaviour and instead, a test of attitude towards this practice of blurring the distinction between business and personal ownership. The researcher also considered the topic categorisation of this item. The item could have fallen under the topic of budgeting and planning as an alternative categorisation. However the researcher decided to maintain the item under the financial data preparation topic category as while this is an attitude based question, the researcher believes that those business owners who frequently use the business petty cash for personal use are unlikely to record this usage systematically. Therefore, the attitude and behaviour around this practice are likely to affect the accurate preparation of the business financial data predominantly.

Topic	Original Item Text	Revised Item Text	Commentary
E. FINANCIAL DATA ANALYSIS	n/a	Assess the following statement. It is good to have *no* debt in your business.	This item is a new inclusion to the survey instrument and seeks to capture the attitude of the respondent towards debt within the business. The inclusion of this item followed the discussion with the expert group members who had personally experienced reticence from business owners to fund any expansion or assets through debt financing. This reticence may prove to be age-related in the sense that if a respondent has experienced a high-interest rate environment (debt difficult to service), they may be mentally affected by that experience. It may make them unwilling to consider that at times, and used appropriately; debt financing can be suitable within a business capital structure.
G. REVENUE GENERATION	Do you include your time cost when estimating what it costs your business to generate revenue?	When you set the prices your business charges your customers for goods and services, do you include the cost of your time and effort to the business in the selling price that is paid by the customer?	The researcher has noted many instances where the pricing of goods and services does not correctly incorporate the actual cost of the business principle. The lack of cost inclusion is particularly pertinent when it comes to the amount of time the business principle devotes to the sales process. For instance, the principle will attend multiple meetings with a prospective client but does not account for their “billable hours” within that process. While the underestimation of the actual expense to the business may show up more obviously in the business profit margin and not in headline revenues, the researcher believes that improper pricing of goods and services is a common problem among small businesses and is particularly prevalent in service-based businesses.

Topic	Original Item Text	Revised Item Text	Commentary
			Therefore, the decision was to retain the underlying objective of the question but simplify the text.
	Your business functions within a bigger market. How often do you read, watch or listen to information about that market?	Your business runs in a broader economy. How often do you read, watch or listen to news and information about that economy?	The initial objective of this item was to assess the level of interest and awareness about the macroeconomic environment in which the business operates. A growing or contracting economic environment will likely materially affect the revenue prospects of a business, and business owners should not be unaware of the prevailing conditions. The original question text used the descriptor "market", but the intention was for the term market to convey the macroeconomic environment. Given that this was not the interpretation of the expert group, the researcher amended the item text to be more specific.

Appendix B. Pilot Group Analysis

Appendix Table B-1: Attitude Item Revision post-Pilot Group

Item No	Item	Action Taken
34	Assess the statement. If the directors of a business make reckless decisions, then they should be punished.	On reflection, the use of the terms "reckless" and "punished" created a leading scenario in which all of the pilot respondents indicated agreement. The item text will undergo revision to include a morally grey action by a director to elicit what respondents feel about potentially inappropriate behaviour.
13	Assess the following statement. Making sure your business documents are stored and saved correctly adds to the success of your business.	Based upon the expert group feedback, this item was previously altered and by replacing the phrase "critical to the success of your business" with "adds to the success of your business". However, following the results of the pilot survey, it was decided to revert back to the original formulation.
17	Assess the following statement. It is acceptable for the business owner to use the business petty cash (banknotes and coins) to pay for personal expenses.	Subsequent to the pilot survey, specifically for better anchor consistency throughout the survey instrument, the Likert scale anchors of "Never" to "Always" were replaced with the anchors "Strongly Disagree/Strongly Agree".
25	Assess the following statement. It is okay for your business to spend more than budgeted on expenses.	On reflection, this item was judged to be vague to respondents as there was no guidance on the frequency of over-spending. Occasionally spending more than the budget may be perfectly acceptable, especially if it is in the pursuit of a new and viable revenue stream. The text was therefore amended to assess the attitude of the respondent to frequently spending over the proposed budget.

Appendix C. Data Preparation

Appendix Table C-1: Data Preparation & Recoding of the Pilot Survey for Statistical Import

Item No	Item Text	SPSS Variable Label	Option Text and Numerical Values Assigned				
Consent							
n/a	Do you consent to participate in this anonymous functional financial literacy survey?	Consent	Yes	No			
			1	2			
Section A: About You (DEM)							
Item No	**Item Text**	**SPSS Variable Label**	**Option Text and Numerical Values Assigned**				
1	How do you describe yourself?	DEM_Gender	Male	Female	Transgender	I do not identify as male, female or transgender	I would prefer not to answer
			1	2	3	4	999
2	What is your date of birth?	DEM_DOB					
3	Which population group best describes you?	DEM_Race	Black African	Coloured	Indian/Asian	White	I would prefer not to answer
			1	2	3	4	999
4	What is the highest level of education have you completed?	DEM_Education	I have *not* completed high school	I have completed high school (Grade 12)	Industry qualification, trade certificate or diploma	Undergraduate degree	Post-graduate degree
			1	2	3	4	5

Section B: About Your Business (BUS)

Item No	Item Text	SPSS Variable Label	Option Text and Numerical Values Assigned				
5	In what year did your business start operating?	BUS_BusStart					
6	Which statement best describes what your business does most of the time?	BUS_Type	My business sells goods	My business provides services	My business sells goods and provides services		
			1	2	3		
7	Which statement best describes your role in the business? Please check all that apply.	BUS_Involvement_NULL	I own all or part of the business	I am involved in making financial decisions for the business	I am involved in the daily business operations	None of the above statements describes my role	
			1	2	3	999	
8	How many people work in your business every day? If you make use of freelancers or other contract staff, count the typical number of freelancers or contract staff working each day.	BUS_Employees	I am the only one	10 or less including me	50 or less including me	250 or less including me	More than 250 including me
			1	2	3	4	5

Section C: Record Keeping (RK)

Item No	Item Text	SPSS Variable Label	Option Text and Numerical Values Assigned				
9	You own a business called ABC Trading. Which transaction has occurred if you have the following business document?	RK_Invoice	**A customer has bought goods from you**	A supplier has sold goods to you	A customer has paid you	A supplier has paid you	Not sure

			1	2	3	4	999
10	You need to show someone a financial business document *within the next hour* from a transaction that took place three months ago. If it is not a bank statement that is needed, how hard or easy would it be for you to find the document in time?	RK_FindDoc	Very hard	Somewhat hard	Neutral	**Somewhat easy**	**Very easy**
			1	2	3	**4**	**5**
11	How often does someone store and capture your business financial transactions?	RK_SaveStore	Each year	Each month	**Each week**	**Each day**	Not sure
			1	2	**3**	**4**	999
12	You have this quote from a supplier. Your business is registered for VAT. You can use this document to claim back R2,064 in VAT.	RK_VAT	TRUE	**FALSE**	Not sure		
			1	**2**	999		
13	Assess the following statement. Making sure your business documents are stored and saved correctly adds to the success of your business.	RK_Attitude	Strongly disagree	Somewhat disagree	Neutral	**Somewhat agree**	**Strongly agree**
			1	2	3	**4**	**5**

Section D: Financial Data Preparation (FP)

Item No	Item Text	SPSS Variable Label	Option Text and Numerical Values Assigned				
14	How often do you review your business profits or losses?	FP_PnLReview	Each year	Each quarter	**Each month**	**Each week**	I don't review
			1	2	**3**	**4**	999
15	The income statement shows which one of the following?	FP_IncomeStatement	Assets and liabilities	**Income and expenses**	Receipts and payments	Equity and cash balance	Not sure
			1	**2**	3	4	999
16		FP_SmallTransaction	**TRUE**	FALSE	Not sure		

	A bank transaction fee of R0.83 should be recorded as part of your business accounts.		**1**	2	999		
17	Assess the following statement. It is acceptable for the business owner to use the business petty cash (banknotes and coins) to pay for personal expenses.	FP_PettyCash	**Never**	**Weak never**	Neutral	Weak always	Always
			1	**2**	3	4	5
18	The following is a sample of a business cash flow statement. What is the net cash flow for the business?	FP_CashFlow	110,000	**0**	-15,000	30,000	Not sure
			1	**2**	3	4	999

Section E: Financial Data Analysis (FA)

Item No	Item Text	SPSS Variable Label	Option Text and Numerical Values Assigned				
19	Assess the following statement. I am confident that I have the skills needed to analyse my business finances.	FA_Confidence	Strongly disagree	Somewhat disagree	Neutral	**Somewhat agree**	**Strongly agree**
			1	2	3	**4**	**5**
20	Make use of the information below. Calculate the gross profit margin.	FA_GPMargin	45%	10%	**55%**	100%	Not sure
			1	2	**3**	4	999
21	Assess the following statement. It is good to have *no* debt in your business.	FA_NoDebt	**Strongly disagree**	**Somewhat disagree**	Neutral	Somewhat agree	Strongly agree
			1	**2**	3	4	5
22	It is possible for my business to make profits but run out of cash.	FA_ProfitvCash	**TRUE**	FALSE	Not sure		
			1	2	999		

Section F: Budgeting & Planning (BP)

Item No	Item Text	SPSS Variable Label	Option Text and Numerical Values Assigned				
23	A new machine costs R50,000 and can be used for 5 years after which it is no longer usable. The machine allows your business to make cash profits of R7,000 per year. Buying the machine is a good business decision.	BP_CapitalBudget	TRUE	**FALSE**	Not sure		
			1	**2**	999		
24	How often do you think about what your business would do if it ran out of cash?	BP_NoCash	Never	Weak never	Neutral	**Weak always**	**Always**
			1	2	3	**4**	**5**
25	Assess the following statement. It is okay for your business to spend more than budgeted on expenses.	BP_Expenses	**Strongly disagree**	**Somewhat disagree**	Neutral	Somewhat agree	Strongly agree
			1	**2**	3	4	5

Section G: Revenue Generation (RG)

Item No	Item Text	SPSS Variable Label	Option Text and Numerical Values Assigned				
26	To increase the gross margin of your business, what step can you take?	RG_GPMargin	Increase the number of products sold	Reduce the number of the products sold	**Increase the selling price of the products sold**	Reduce the selling price of products sold	Not sure
			1	2	**3**	4	999
27	When you set the prices your business charges your customers for goods and services, do you include the cost of your time and effort to the business in the selling price that is paid by the customer?	RG_TimeCost	Never	Weak never	Neutral	**Weak always**	**Always**
			1	2	3	**4**	**5**

28	Using the financial data below: how many items do you need to sell each month to pay for your monthly overheads?	RG_Breakeven	25 items	**40 items**	50 items	100 items	Not sure
			1	**2**	3	4	999
29	Your business sells goods and services to an overseas market, and your local currency strengthens. Your local currency revenue will increase.	RG_FX	TRUE	**FALSE**	Not sure		
			1	**2**	999		
30	Your business functions within a broader economy. How often do you read, watch or listen to information about that economy?	RG_Economy	Never	Weak never	Neutral	**Weak always**	**Always**
			1	2	3	**4**	**5**

Section H: Engaging with Financial Services Providers (FSP)

Item No	Item Text	SPSS Variable Label	Option Text and Numerical Values Assigned				
31	When you sign up for a new financial product (bank account/insurance policy/loan), you read all of the legal "fine print".	FSP_FinePrint	Never	Weak never	Neutral	**Weak always**	**Always**
			1	2	3	**4**	**5**
32	The financial data below shows how your business is financed. If you want to pay the founding team a dividend of R5 per share, how much do you need to pay the other business financiers?	FSP_Divdends	Bank: R0; Family investor: R0	**Bank: R0; Family investor: R500**	Bank: R2,500; Family investor: R500	Bank: R2,500; Family investor: R0	Not sure
			1	**2**	3	4	999

Section I: Engaging with Regulators & Regulations (REG)

Item No	Item Text	SPSS Variable Label	Option Text and Numerical Values Assigned				
33	If your business makes a profit then income tax will need to be paid to the tax authority.	REG_IncomeTax	**TRUE** **1**	FALSE 2	Not sure 999		
34	Assess the statement. If the directors of a business make reckless decisions, then they should be punished.	REG_Directors	Strongly disagree 1	Somewhat disagree 2	Neutral 3	**Somewhat agree** **4**	**Strongly agree** **5**
35	Once each year, your business produces financial statements.	REG_AFS	Never 1	Weak never 2	Neutral 3	**Weak always** **4**	**Always** **5**

Section J: General

Item No	Item Text	SPSS Variable Label	Option Text and Numerical Values Assigned
36	What does the term "business finances" mean to you?	General	

Appendix D. Reporting of Respondent Data

Appendix Table D-1: Mean Knowledge Scores by Enterprise Status and Gender

Enterprise Status	Gender	N	Mean	Std. Deviation	Minimum	Maximum
Sole Trader	Male	9	0.65	0.22	0.23	0.92
	Female	16	0.66	0.18	0.38	1.00
	Trans	1	0.31		0.31	0.31
	Total	26	0.64	0.20	0.23	1.00
Microbusiness	Male	37	0.75	0.15	0.23	1.00
	Female	31	0.66	0.16	0.31	1.00
	Total	68	0.71	0.16	0.23	1.00
Small Business	Male	20	0.82	0.15	0.54	1.00
	Female	7	0.85	0.10	0.69	1.00
	Trans	2	0.85	0.00	0.85	0.85
	Total	29	0.82	0.13	0.54	1.00
Total	Male	66	0.76	0.17	0.23	1.00
	Female	54	0.68	0.17	0.31	1.00
	Trans	3	0.67	0.31	0.31	0.85
	Total	**123**	**0.72**	**0.17**	**0.23**	**1.00**

Appendix Table D-2: Knowledge Items - Respondents Answering "not sure"

		Sole Traders				Microbusiness				Small Business			
		Male	Female	Trans	**Total**	Male	Female	Trans	**Total**	Male	Female	Trans	Total
Item No	**N**	9	16	1	**26**	37	31	0	**68**	20	7	2	**29**
9	RK_Invoice	0	0	0	**0**	0	0	0	**0**	0	0	0	0
12	RK_VAT	1	1	1	**3**	5	4	0	**9**	0	0	0	0
15	FP_IncomeStatement	1	0	0	**1**	1	2	0	**3**	0	0	0	0
16	FP_SmallTransaction	1	3	0	**4**	3	2	0	**5**	1	0	0	1
18	FP_CashFlow	3	5	1	**9**	6	11	0	**17**	1	2	0	3
20	FA_GPMargin	0	3	1	**4**	3	3	0	**6**	1	0	0	1
21	FA_ProfitvCash	0	0	0	**0**	1	6	0	**7**	1	0	0	1
22	BP_CapitalBudget	0	0	0	**0**	0	2	0	**2**	1	1	0	2
25	RG_GPMargin	0	2	1	**3**	0	0	0	**0**	0	0	0	0
27	RG_Breakeven	0	2	1	**3**	1	1	0	**2**	0	0	0	0
28	RG_FX	0	2	0	**2**	1	3	0	**4**	0	1	0	1
31	FSP_Dividends	5	8	1	**14**	6	14	0	**20**	4	1	0	5
32	REG_IncomeTax	0	0	0	**0**	2	1	0	**3**	1	0	0	1
	Total "not sure"	**11**	**26**	**6**	**43**	**29**	**49**	**0**	**78**	**10**	**5**	**0**	**15**
	Proportion	**9.4%**	**12.5%**	**46.2%**	**12.7%**	**6.0%**	**12.2%**	**0.0%**	**8.8%**	**3.8%**	**5.5%**	**0.0%**	**4.0%**

Appendix Table D-3: Knowledge Items - Respondents Answering "not sure"

		Total			
		Male	Female	Trans	**Total**
Item No	**N**	67	53	3	**123**
9	RK_Invoice	0	0	0	**0**
12	RK_VAT	6	5	1	**12**
15	FP_IncomeStatement	2	2	0	**4**
16	FP_SmallTransaction	5	5	0	**10**
18	FP_CashFlow	10	18	1	**29**
20	FA_GPMargin	4	6	1	**11**
21	FA_ProfitvCash	2	6	0	**8**
22	BP_CapitalBudget	1	3	0	**4**
25	RG_GPMargin	0	2	1	**3**
27	RG_Breakeven	1	3	1	**5**
28	RG_FX	1	6	0	**7**
31	FSP_Dividends	15	23	1	**39**
32	REG_IncomeTax	3	1	0	**4**
	Total "not sure"	**50**	**80**	**6**	**136**
	Proportion	**5.7%**	**11.6%**	**15.4%**	**8.5%**

Appendix Table D-4: Behaviour Item Response by Enterprise Status

Item No	Variable Label	Response	Sole Trader	Microbusiness	Small Business	Total
	N		26	68	29	123
10	RK_FindDoc	Very hard	11.5%	2.9%	0.0%	4.1%
		Somewhat hard	7.7%	2.9%	3.4%	4.1%
		Neutral	15.4%	17.6%	3.4%	13.8%
		Somewhat easy	30.8%	27.9%	20.7%	26.8%
		Very easy	34.6%	48.5%	72.4%	51.2%
11	RK_SaveStore	Each year	19.2%	16.2%	0.0%	13.0%
		Each month	34.6%	30.9%	31.0%	31.7%
		Each week	19.2%	25.0%	10.3%	20.3%
		Each day	7.7%	19.1%	58.6%	26.0%
		Not sure	19.2%	8.8%	0.0%	8.9%
14	FP_PnLReview	Each year	15.4%	13.2%	10.3%	13.0%
		Each quarter	11.5%	22.1%	10.3%	17.1%
		Each month	46.2%	50.0%	62.1%	52.0%
		Each week	3.8%	8.8%	17.2%	9.8%
		I don’t review	23.1%	5.9%	0.0%	8.1%
26	RG_TimeCost	Strongly disagree	11.5%	4.4%	0.0%	4.9%
		Somewhat disagree	15.4%	7.4%	6.9%	8.9%
		Neutral	15.4%	23.5%	20.7%	21.1%
		Somewhat agree	26.9%	22.1%	27.6%	24.4%
		Strongly agree	30.8%	42.6%	44.8%	40.7%

29	RG_Economy	Never	11.5%	1.5%	0.0%	3.3%
		Weak never	3.8%	10.3%	3.4%	7.3%
		Neutral	26.9%	25.0%	13.8%	22.8%
		Weak always	34.6%	35.3%	31.0%	34.1%
		Always	23.1%	27.9%	51.7%	32.5%
30	FSP_FinePrint	Strongly disagree	7.7%	10.3%	10.3%	9.8%
		Somewhat disagree	26.9%	26.5%	13.8%	23.6%
		Neutral	23.1%	22.1%	10.3%	19.5%
		Somewhat agree	11.5%	19.1%	34.5%	21.1%
		Strongly agree	30.8%	22.1%	31.0%	26.0%
34	REG_AFS	Full financial statements are not produced	11.5%	20.6%	0.0%	13.8%
		Full financial statements are sometimes produced	23.1%	10.3%	3.4%	11.4%
		Full financial statements are always produced	46.2%	66.2%	96.6%	69.1%
		Not sure	19.2%	2.9%	0.0%	5.7%

Appendix Table D-5: Attitude Items - Mean Scores by Enterprise Status

Item No	Item	Enterprise Status	Mean	Std. Deviation
13	RK_Attitude	Sole Trader	4.50	0.81
		Microbusiness	4.65	0.66
		Small Business	4.79	0.41
		Total	4.65	0.65
19	FA_Confidence	Sole Trader	3.04	1.31
		Microbusiness	3.28	1.14
		Small Business	4.14	0.83
		Total	3.43	1.18
23	BP_NoCash	Sole Trader	4.08	1.23
		Microbusiness	4.31	0.83
		Small Business	4.66	0.61
		Total	4.34	0.90
17	FP_REV_PettyCash	Sole Trader	4.69	0.68
		Microbusiness	4.57	0.87
		Small Business	4.83	0.76
		Total	4.66	0.81
33	REG_REV_Directors	Sole Trader	4.58	1.03
		Microbusiness	4.69	0.74
		Small Business	4.76	0.69
		Total	4.68	0.79
24	BP_REV_Expenses	Sole Trader	4.35	1.06
		Microbusiness	4.16	0.92
		Small Business	4.55	0.69
		Total	4.29	0.91

Appendix E. Analysis of Respondent Data

Appendix Table E-1: Regression Model - Composite Financial Literacy Score

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	0.760	0.049		15.481	0.000	0.662	0.857		
DEM_Gender=Female	-0.033	0.017	-0.152	-1.964	0.052	-0.066	0.000	0.875	1.143
DEM_Education=I have *not* completed high school	-0.221	0.066	-0.260	-3.372	0.001	-0.351	-0.091	0.882	1.134
DEM_Education=I have completed high school (Grade 12)	-0.070	0.031	-0.200	-2.290	0.024	-0.131	-0.009	0.686	1.458
DEM_Education=Industry qualification, trade certificate or diploma	0.006	0.024	0.024	0.252	0.801	-0.041	0.053	0.592	1.690
DEM_Education=Post-graduate degree	0.021	0.021	0.094	0.979	0.330	-0.021	0.062	0.571	1.751
BUS_Type=My business sells goods	-0.016	0.022	-0.056	-0.711	0.479	-0.060	0.028	0.834	1.199
BUS_Type=My business sells goods and provides services	0.007	0.021	0.026	0.314	0.754	-0.035	0.048	0.767	1.304
BUS_Employees=I am the only one	-0.043	0.021	-0.164	-2.043	0.044	-0.085	-0.001	0.810	1.235
BUS_Employees=50 or less including me	0.078	0.022	0.309	3.538	0.001	0.034	0.122	0.684	1.461
DEM_Race=Black African	-0.013	0.021	-0.056	-0.606	0.545	-0.055	0.029	0.607	1.647
DEM_Race=Coloured	0.018	0.027	0.055	0.663	0.509	-0.036	0.072	0.768	1.302
DEM_Race=Indian/Asian	-0.037	0.040	-0.074	-0.924	0.358	-0.117	0.042	0.810	1.235
DEM_Race=I would prefer not to answer	-0.062	0.038	-0.124	-1.610	0.110	-0.138	0.014	0.886	1.129
DEM_AGE_YR	0.001	0.001	0.083	0.985	0.327	-0.001	0.003	0.742	1.348
BUS_AGE	0.000	0.001	0.016	0.196	0.845	-0.002	0.002	0.755	1.324

a. Dependent Variable: SCORE_TOTAL_REV

Appendix Table E-2: Regression Model - Knowledge Dimension Score

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	0.732	0.081		9.085	0.000	0.573	0.892		
DEM_Gender=Female	-0.054	0.028	-0.147	-1.970	0.051	-0.109	0.000	0.875	1.143
DEM_Education=I have *not* completed high school	-0.426	0.108	-0.295	-3.960	0.000	-0.639	-0.213	0.882	1.134
DEM_Education=I have completed high school (Grade 12)	-0.162	0.050	-0.272	-3.222	0.002	-0.261	-0.062	0.686	1.458
DEM_Education=Industry qualification, trade certificate or diploma	0.024	0.039	0.057	0.623	0.534	-0.053	0.102	0.592	1.690
DEM_Education=Post-graduate degree	0.086	0.035	0.232	2.501	0.014	0.018	0.155	0.571	1.751
BUS_Type=My business sells goods	0.006	0.037	0.012	0.160	0.873	-0.067	0.078	0.834	1.199
BUS_Type=My business sells goods and provides services	0.025	0.034	0.058	0.729	0.468	-0.043	0.092	0.767	1.304
BUS_Employees=I am the only one	-0.052	0.035	-0.116	-1.498	0.137	-0.121	0.017	0.810	1.235
BUS_Employees=50 or less including me	0.069	0.036	0.160	1.895	0.061	-0.003	0.141	0.684	1.461
DEM_Race=Black African	-0.072	0.035	-0.187	-2.084	0.040	-0.141	-0.004	0.607	1.647
DEM_Race=Coloured	-0.043	0.045	-0.078	-0.971	0.334	-0.132	0.045	0.768	1.302
DEM_Race=Indian/Asian	-0.062	0.066	-0.073	-0.945	0.347	-0.193	0.068	0.810	1.235
DEM_Race=I would prefer not to answer	-0.118	0.063	-0.139	-1.874	0.064	-0.243	0.007	0.886	1.129
DEM_AGE_YR	0.001	0.002	0.040	0.498	0.620	-0.002	0.004	0.742	1.348
BUS_AGE	0.002	0.002	0.074	0.916	0.362	-0.002	0.005	0.755	1.324

a. Dependent Variable: score_KNOWLEDGE_REV

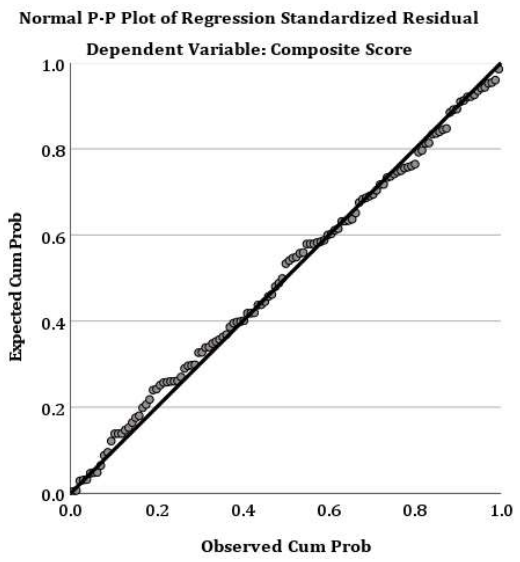
Appendix Table E-3: Regression Model - Behaviour Dimension Score

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	0.730	0.074		9.856	0.000	0.583	0.876		
DEM_Gender=Female	-0.026	0.025	-0.090	-1.028	0.306	-0.076	0.024	0.875	1.143
DEM_Education=I have *not* completed high school	-0.239	0.099	-0.210	-2.419	0.017	-0.435	-0.043	0.882	1.134
DEM_Education=I have completed high school (Grade 12)	-0.031	0.046	-0.066	-0.674	0.502	-0.122	0.060	0.686	1.458
DEM_Education=Industry qualification, trade certificate or diploma	-0.008	0.036	-0.023	-0.212	0.833	-0.079	0.064	0.592	1.690
DEM_Education=Post-graduate degree	-0.023	0.032	-0.079	-0.735	0.464	-0.086	0.040	0.571	1.751
BUS_Type=My business sells goods	-0.030	0.034	-0.081	-0.903	0.369	-0.097	0.036	0.834	1.199
BUS_Type=My business sells goods and provides services	0.011	0.031	0.034	0.365	0.716	-0.050	0.073	0.767	1.304
BUS_Employees=I am the only one	-0.064	0.032	-0.183	-2.018	0.046	-0.128	-0.001	0.810	1.235
BUS_Employees=50 or less including me	0.088	0.033	0.261	2.646	0.009	0.022	0.155	0.684	1.461
DEM_Race=Black African	-0.009	0.032	-0.029	-0.277	0.782	-0.072	0.054	0.607	1.647
DEM_Race=Coloured	0.061	0.041	0.138	1.485	0.140	-0.020	0.142	0.768	1.302
DEM_Race=Indian/Asian	-0.009	0.061	-0.013	-0.146	0.884	-0.129	0.111	0.810	1.235
DEM_Race=I would prefer not to answer	-0.053	0.058	-0.080	-0.917	0.361	-0.168	0.062	0.886	1.129
DEM_AGE_YR	0.001	0.001	0.057	0.601	0.549	-0.002	0.004	0.742	1.348
BUS_AGE	0.001	0.002	0.028	0.301	0.764	-0.003	0.004	0.755	1.324

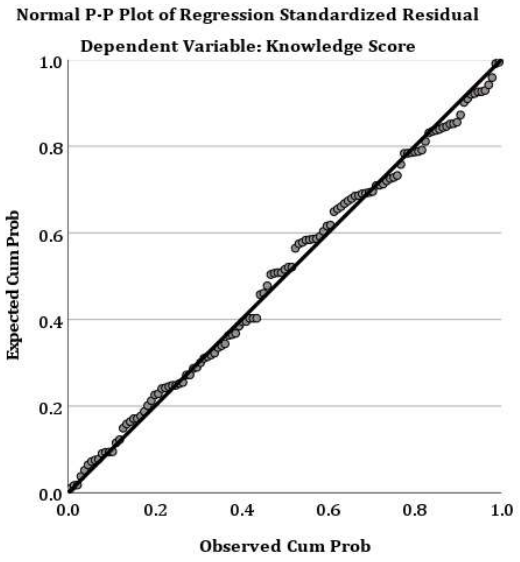
a. Dependent Variable: SCORE_BEHAVIOUR_SCALED

Appendix Table E-4: Regression Model - Attitude Dimension Score

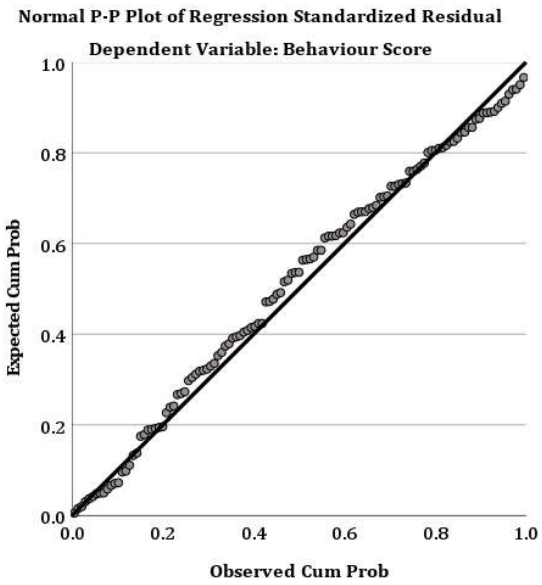
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	0.817	0.047		17.574	0.000	0.725	0.910		
DEM_Gender=Female	-0.019	0.016	-0.104	-1.167	0.246	-0.050	0.013	0.875	1.143
DEM_Education=I have *not* completed high school	0.002	0.062	0.004	0.040	0.969	-0.121	0.126	0.882	1.134
DEM_Education=I have completed high school (Grade 12)	-0.017	0.029	-0.060	-0.591	0.555	-0.075	0.040	0.686	1.458
DEM_Education=Industry qualification, trade certificate or diploma	0.001	0.023	0.006	0.055	0.956	-0.044	0.046	0.592	1.690
DEM_Education=Post-graduate degree	-0.001	0.020	-0.007	-0.066	0.948	-0.041	0.038	0.571	1.751
BUS_Type=My business sells goods	-0.023	0.021	-0.100	-1.090	0.278	-0.065	0.019	0.834	1.199
BUS_Type=My business sells goods and provides services	-0.017	0.020	-0.081	-0.849	0.398	-0.056	0.022	0.767	1.304
BUS_Employees=I am the only one	-0.013	0.020	-0.061	-0.657	0.513	-0.053	0.027	0.810	1.235
BUS_Employees=50 or less including me	0.078	0.021	0.375	3.705	0.000	0.036	0.119	0.684	1.461
DEM_Race=Black African	0.043	0.020	0.229	2.133	0.035	0.003	0.082	0.607	1.647
DEM_Race=Coloured	0.036	0.026	0.135	1.418	0.159	-0.015	0.087	0.768	1.302
DEM_Race=Indian/Asian	-0.040	0.038	-0.098	-1.053	0.295	-0.115	0.035	0.810	1.235
DEM_Race=I would prefer not to answer	-0.014	0.036	-0.035	-0.390	0.697	-0.086	0.058	0.886	1.129
DEM_AGE_YR	0.001	0.001	0.126	1.299	0.197	-0.001	0.003	0.742	1.348
BUS_AGE	-0.002	0.001	-0.139	-1.447	0.151	-0.004	0.001	0.755	1.324
a. Dependent Variable: SCORE_ATTITUDE_SCALED									



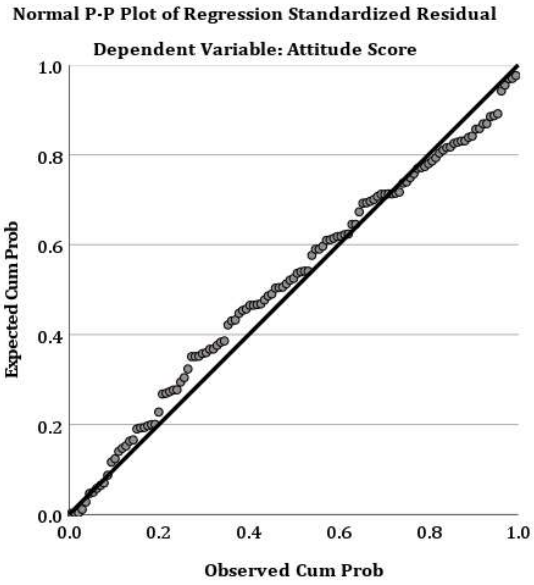
Composite Financial Literacy Score



Knowledge Dimension Score



Behaviour Dimension Score



Attitude Dimension Score

Appendix Figure E-1: P-P Plots of Regression Standardized Residual

Appendix Table E-5: Composite Financial Literacy Score – Education Level Tukey Post-Hoc Test

(I) Education	(J) Education	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
I have *not* completed high school	I have completed high school (Grade 12)	-0.17	0.06	0.06	-0.35	0.00
	Industry qualification, trade certificate or diploma	-.2455*	0.06	0.00	-0.41	-0.08
	Undergraduate degree	-.2540*	0.06	0.00	-0.42	-0.09
	Post-graduate degree	-.2759*	0.06	0.00	-0.44	-0.11
I have completed high school (Grade 12)	I have *not* completed high school	0.17	0.06	0.06	0.00	0.35
	Industry qualification, trade certificate or diploma	-0.07	0.03	0.08	-0.15	0.00
	Undergraduate degree	-.0826*	0.03	0.03	-0.16	0.00
	Post-graduate degree	-.1045*	0.03	0.00	-0.18	-0.03
Industry qualification, trade certificate or diploma	I have *not* completed high school	.2455*	0.06	0.00	0.08	0.41
	I have completed high school (Grade 12)	0.07	0.03	0.08	0.00	0.15
	Undergraduate degree	-0.01	0.02	0.99	-0.07	0.05
	Post-graduate degree	-0.03	0.02	0.54	-0.09	0.02
Undergraduate degree	I have *not* completed high school	.2540*	0.06	0.00	0.09	0.42
	I have completed high school (Grade 12)	.0826*	0.03	0.03	0.00	0.16
	Industry qualification, trade certificate or diploma	0.01	0.02	0.99	-0.05	0.07
	Post-graduate degree	-0.02	0.02	0.79	-0.08	0.03
Post-graduate degree	I have *not* completed high school	.2759*	0.06	0.00	0.11	0.44
	I have completed high school (Grade 12)	.1045*	0.03	0.00	0.03	0.18
	Industry qualification, trade certificate or diploma	0.03	0.02	0.54	-0.02	0.09
	Undergraduate degree	0.02	0.02	0.79	-0.03	0.08

Based on observed means.
The error term is Mean Square(Error) = .007.
**. The mean difference is significant at the 0.05 level.*

Appendix Table E-6: Knowledge Score – Education Level Tukey Post-Hoc Test

(I) Education	(J) Education	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
I have *not* completed high school	I have completed high school (Grade 12)	-.3194*	0.11	0.03	-0.62	-0.02
	Industry qualification, trade certificate or diploma	-.4851*	0.10	0.00	-0.77	-0.20
	Undergraduate degree	-.4770*	0.10	0.00	-0.76	-0.19
	Post-graduate degree	-.5761*	0.10	0.00	-0.86	-0.29
I have completed high school (Grade 12)	I have *not* completed high school	.3194*	0.11	0.03	0.02	0.62
	Industry qualification, trade certificate or diploma	-.1657*	0.05	0.01	-0.30	-0.03
	Undergraduate degree	-.1576*	0.05	0.01	-0.29	-0.02
	Post-graduate degree	-.2566*	0.05	0.00	-0.38	-0.13
Industry qualification, trade certificate or diploma	I have *not* completed high school	.4851*	0.10	0.00	0.20	0.77
	I have completed high school (Grade 12)	.1657*	0.05	0.01	0.03	0.30
	Undergraduate degree	0.01	0.04	1.00	-0.10	0.11
	Post-graduate degree	-0.09	0.03	0.06	-0.18	0.00
Undergraduate degree	I have *not* completed high school	.4770*	0.10	0.00	0.19	0.76
	I have completed high school (Grade 12)	.1576*	0.05	0.01	0.02	0.29
	Industry qualification, trade certificate or diploma	-0.01	0.04	1.00	-0.11	0.10
	Post-graduate degree	-.0991*	0.03	0.03	-0.19	-0.01
Post-graduate degree	I have *not* completed high school	.5761*	0.10	0.00	0.29	0.86
	I have completed high school (Grade 12)	.2566*	0.05	0.00	0.13	0.38
	Industry qualification, trade certificate or diploma	0.09	0.03	0.06	0.00	0.18
	Undergraduate degree	.0991*	0.03	0.03	0.01	0.19

Based on observed means.
The error term is Mean Square(Error) = .020.
**. The mean difference is significant at the 0.05 level.*

Appendix Table E-7: Composite Financial Literacy Score - Tukey Post-Hoc Test Enterprise Status

(I) Enterprise Status	(J) Enterprise Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Sole Trader	Microbusiness	-.0625*	0.02	0.00	-0.11	-0.02
	Small Business	-.1610*	0.02	0.00	-0.21	-0.11
Microbusiness	Sole Trader	.0625*	0.02	0.00	0.02	0.11
	Small Business	-.0985*	0.02	0.00	-0.14	-0.05
Small Business	Sole Trader	.1610*	0.02	0.00	0.11	0.21
	Microbusiness	.0985*	0.02	0.00	0.05	0.14

Based on observed means.
The error term is Mean Square(Error) = .007.
**. The mean difference is significant at the 0.05 level.*

Appendix Table E-8: Knowledge Score - Tukey Post-Hoc Test Enterprise Status

(I) Enterprise Status	(J) Enterprise Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Sole Trader	Microbusiness	-.0939*	0.03	0.01	-0.17	-0.02
	Small Business	-.2040*	0.04	0.00	-0.29	-0.11
Microbusiness	Sole Trader	.0939*	0.03	0.01	0.02	0.17
	Small Business	-.1101*	0.03	0.00	-0.19	-0.03
Small Business	Sole Trader	.2040*	0.04	0.00	0.11	0.29
	Microbusiness	.1101*	0.03	0.00	0.03	0.19

Based on observed means.
The error term is Mean Square(Error) = .020.
**. The mean difference is significant at the 0.05 level.*

Appendix Table E-9: Behaviour Score - Tukey Post-Hoc Test Enterprise Status

(I) Enterprise Status	(J) Enterprise Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Sole Trader	Microbusiness	-.0769*	0.03	0.02	-0.14	-0.01
	Small Business	-.1938*	0.03	0.00	-0.27	-0.12
Microbusiness	Sole Trader	.0769*	0.03	0.02	0.01	0.14
	Small Business	-.1169*	0.03	0.00	-0.18	-0.05
Small Business	Sole Trader	.1938*	0.03	0.00	0.12	0.27
	Microbusiness	.1169*	0.03	0.00	0.05	0.18

Based on observed means.
The error term is Mean Square(Error) = .015.
**. The mean difference is significant at the 0.05 level.*

Appendix Table E-10: Attitude Score - Tukey Post-Hoc Test Enterprise Status

(I) Enterprise Status	(J) Enterprise Status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Sole Trader	Microbusiness	-0.0166	0.02	0.66	-0.06	0.03
	Small Business	-.0852*	0.02	0.00	-0.14	-0.03
Microbusiness	Sole Trader	0.0166	0.02	0.66	-0.03	0.06
	Small Business	-.0685*	0.02	0.00	-0.11	-0.02
Small Business	Sole Trader	.0852*	0.02	0.00	0.03	0.14
	Microbusiness	.0685*	0.02	0.00	0.02	0.11

Based on observed means.
The error term is Mean Square(Error) = .007.
**. The mean difference is significant at the 0.05 level.*

Appendix F. Ethics Approval

Faculty of Commerce

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08/05/2020

Tarryn Valle

Department of Finance and Tax

University of Cape Town

REF: 2020/05/003

Functional Financial Literacy of Entrepreneurs

We are pleased to inform you that your ethics application has been approved. Unless otherwise specified this ethical clearance is valid until 31-May-2021 .

Your clearance may be renewed upon application.

Please be aware that you need to notify the Ethics Committee immediately should any aspect of your study regarding the engagement with participants as approved in this application, change. This may include aspects such as changes to the research design, questionnaires, or choice of participants.

The ongoing ethical conduct throughout the duration of the study remains the responsibility of the principal investigator.

We wish you well for your research.

2020.05.08
15:45:29 +02'00'

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