An Exploratory Study of Objective Islamic Financial Literacy in the Context of Malaysia*

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Abstract: This study develops a comprehensive, objective measure of Islamic financial literacy (IFL) that encompasses six core concepts: general concepts, numeracy and computational skills, Islamic financial concepts, savings and investments, borrowing and financing, and financial protection. Seven practitioners working in the Islamic banking and finance industry in Malaysia were chosen to validate the measure before pilot testing on a sample of 403 working-age adult respondents. The financial literacy scores are compared across samples of students, general working adults, and bankers and significant differences are identified in the scores for financial protection; only marginal differences exist for general concepts, knowledge of Islamic financial concepts, and overall IFL scores. Among students, there are significant associations between respondent's IFL and variables such as ethnicity, programme of study, and year of study, while among bankers, education level is positively associated with IFL. For general working adults, however, the study finds an insignificant relationship between most of the independent variables (demographic characteristics) and IFL.

Keywords: Islamic financial literacy, Islamic financial concepts, Islamic financial products.

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Introduction

Numerous studies suggest that a high level of financial literacy (FL) contributes to the financial well-being of individuals in relation to their wealth acquisition, savings (Grinstein-Weiss et al., 2015), investments (van Rooij et al., 2011), and retirement planning (Lusardi & Mitchell, 2011a). FL refers to the ability to use financial knowledge and skills to manage financial resources effectively for present-day and future financial well-being. The knowledge and skills necessary for effective financial decision-making are subject to the financial context in which they must be employed (Collins & O'Rourke, 2010). This requirement is pertinent in the setting of the Islamic financial system, where Shariah principles require different mechanisms for all Islamic financial products. The knowledge that is relevant to evaluating these products includes the prohibition of interest (*riba*), uncertainty (*gharar*), and speculation (*maisir*), as well as the applied Shariah contracts and their implications that become part and parcel of Shariah-compliant deposits and financing products (ISRA, 2016).

In Malaysia, Islamic finance (IF) has been in place for almost four decades, making significant inroads into the local financial system. The remarkable growth of IF and its acceptance in the market are evidenced by the rigorous participation of local and international banks, which have established dedicated subsidiaries or departments to offer Islamic banking products, making up 34.2% of the country's total banking assets (BNM, 2020). Since 2010, the volume of the sukuk market has surpassed the bond market and has remained resilient since, commanding 61.1% of total bonds and sukuk issuances in 2019; Shariah-compliant market capitalisation stood at RM 1,239 billion compared to the total market capitalisation of RM 1,818 billion (SC, 2020).

The Malaysian government, recognising the need to empower Malaysians with the right financial knowledge and skills, launched the Malaysian National Strategy for Financial Literacy (2019–2023). Given that a third of Malaysians considered themselves to have low levels of financial knowledge, the strategy prioritised access to financial management information regarding financial products and services to build and safeguard wealth (FEN, 2019). However, the national strategy reflects a broad concept of FL and does not specifically address Islamic FL (IFL). Research attempting to understand consumers' IFL is thus at a nascent stage with tremendous growth potential.

The dynamic growth of the Islamic finance industry in Malaysia and the low levels of FL cast some doubts on the ability of individuals to make financial decisions. With this rapid spread of financially complex products, it seems necessary to consider

whether relatively unsophisticated clients and investors, such as those in the study, are able to master the different types of Islamic financial services. This study focuses on the state of their IFL and offers an assessment of how well-equipped the households are to make these complex financial decisions.

There are a number of existing studies on the state of IFL across the globe. However, the way IFL is conceptualised and operationalised in these appears fragmented, focusing only on specific knowledge and skill components. Despite attempts to broaden the examination of IFL, most studies have remained focused on testing explicit knowledge and skills in specific areas of Islamic finance, such as participation in banks (Er & Mutlu, 2017) and wealth planning and management (Abdullah & Anderson, 2015; Setyowati et al., 2018). Antara et al. (2017) did generate an IFL scale based on Islamic financial principles, but the measurement did not consider the basic financial and numerical concepts that are fundamental to FL. A notable attempt to incorporate all of the above concepts was made by Setyowati et al. (2018), who examined the impact of IFL on personal financial planning in Indonesia, but with 20 multiple-choice questions, the results represent a generalised form of IFL at best. Another study that have examined IFL, only focused on discovering finance-related knowledge reflected in the teachings of Islam (Md Sapir & Wan Ahmad, 2020).

The main objective of this study is to develop a comprehensive measure for IFL that encompasses six core concepts: general concepts, numeracy and computational skills, knowledge of Islamic financial concepts, savings and investments, borrowing and financing, and financial protection using insurance and *takaful*. In this study, we contribute to the literature by conceptualising IFL as a comprehensive, multidimensional construct. We do this by thoroughly examining the overall cognitive ability factors of IF using a two-pronged approach. First, we consider basic financial concepts and numeracy skills. The former includes the fundamental financial principles of IF, such as the prohibition of interest, uncertainty, and gambling. Second, we incorporate knowledge about a variety of Islamic financial products, which are grounded in a plethora of Islamic principles.

Our construct captures an understanding of the application of a multitude of Shariah contracts in a variety of Islamic financial products. We argue that this comprehensive measure more accurately reflects an individual's level of IFL because the knowledge attained is largely dependent on the rigour of the assessment and the financial context in which the assessment is made (Collins & O'Rourke, 2010). We assess the content validity of the measures through engagement with IF indus-

try experts before validating the formative IFL scale by testing it on three distinct samples of individuals with varying exposures to IF.

For academia, our scale complements the existing IFL measures by considering all the main cognitive ability factors in the major areas of IF. This results in higher measurement accuracy when applied to any research on Islamic personal financial behaviour. The correctness of measurement allows more accurate insights into the level of IFL for each major area of IF to the policymakers. The remainder of this article ensues with a review of the literature followed by the research methodology. Next, we analysed the data and findings before offering some concluding remarks and recommendations.

Literature Review

Financial Literacy

The literature shows that there are inconsistent definitions of FL. Some scholars define it simply as financial knowledge; others see it as the knowledge of basic financial principles and the ability to conduct simple calculations. The definition has also been extended by some scholars to include the ability to understand complex financial instruments (Bucher-Koenen et al., 2016; Lusardi & Mitchell, 2011a; Remund, 2010; Mandell, 2007). A comprehensive definition that includes knowledge and understanding of financial concepts and risks, as well as skills, motivation, and confidence to apply them, was applied by the Organization for Economic Co-Operation and Development (OECD) in 2014 (OECD, 2014).

Ouachani et al. (2021) argued that an unstandardised measure of FL will lead to divergences in measurements and empirical findings, and streamlining of measures was necessary to allow for comparability across studies. They affirmed that the majority of studies have focused on objective FL by measuring individuals' actual financial knowledge and skills. Other studies approach FL from a subjective perspective, measuring individuals' self-confidence in relation to a topic.

Studies have identified FL as a major determinant of financial well-being (e.g., Ranyard et al., 2020). Due to changing conditions and the dynamic nature of financial products, however, there is a need to continuously update FL so that individuals can make better-informed financial decisions, build secure financial futures, enhance their economic stability, and attain their financial goals. Thus, governments around the world have made continued efforts to improve the FL levels of individuals to improve their financial well-being.

Islamic Financial Literacy

As with general FL, the available measures of IFL are equivocal and inconsistent, especially due to the concept's relative novelty (Abdullah, 2014). For Abdullah and Anderson (2015), IFL is a contextualisation of FL based on "the knowledge gained through the use of Islamic financial products and concepts." Islam provides guidelines on all aspects of life, including financial matters. This guidance includes the prohibition of interest, uncertainty, speculation, and unethical investments and specific guidance for Muslims on spending habits, with an emphasis on debt-payment obligation. By following this guidance, Muslims should be able to handle their finances and avoid financial hardship. Staying close to the OECD's general definition of FL, Abdul Rahim, Abdul Rashid, and Hamed (2016) proposed a conceptual definition of IFL as "the ability of a person to use financial knowledge, skills, and attitudes in managing financial resources according to Islamic teachings."

Although many definitions have been employed, previous studies have, for the most part, found low levels of IFL among participants and have suggested that increasing IFL would reduce personal financial misunderstandings and misbehaviour (Sabri et al., 2008; İbrahim et al., 2009; Rahim et al., 2016; Durmuş & Yardımcıoğulları, 2018; Nawi et al., 2018).

General Concepts

Our study attempts to develop a comprehensive measure of IFL from existing studies that encompass various dimensions and range from basic FL to more advanced questions (Lusardi & Mitchell, 2007; Huston, 2010; Nawi et al., 2018; Md Sapir & Wan Ahmad, 2020; Ahmad et al., 2020). The basis of our measure is the work of Lusardi (2017), who used basic FL questions to address numeracy, interest, inflation, and the time value of money; and their advanced FL questions concern stock market functions, mutual funds, and other wealth products. In a review of the literature on FL over a decade, Huston (2010) argued that general concepts should be used to measure the fundamental principles in finance – including inflation, time value of the money, exchange rate, risk, return, and diversification – for both financial knowledge and its application are equally important to FL.

Many studies on IF patronage have revealed that Muslims' knowledge and understanding of IF remain limited (Md Sapir & Wan Ahmad, 2020; Mahdzan et al., 2017). As such, Muslim nations should attend to this IF knowledge gap, as it is critical to the long-term viability of Islamic financial systems. Further, Muslims must completely comprehend Islamic financial principles to fulfil their religious

obligations and achieve high levels of well-being in this life and in the afterlife (Al-baity & Rahman, 2019; Antara et al., 2016). Based on this realisation, the dimensions we develop include measures introduced by Nathie's (2021) study of IF in the Australian context.

We develop a comprehensive measure of IFL based on Huston's (2010) conceptualisation of four dimensions: money basics, borrowing, investing, and protecting resources. These are captured in this study as a general concept of FL, borrowing and financing, savings and investments, and financial protection using *takaful* or insurance. We further extend the measure to cover numeracy, computational skills, and knowledge of Islamic financial concepts.

Numeracy

Numeracy is the skill of using basic mathematics in daily life. Many existing studies have found significant correlations between numeracy skills and FL (Baistaman et al., 2020; Schmeiser & Seligman, 2013; Lusardi & Mitchell, 2007; 2011b). Data from many countries show especially low levels of numeracy among vulnerable groups, such as women and those with less education. This will prove to be a major issue in the future because numeracy has been linked to the quality of financial decision making. Furthermore, globally, most governments and businesses are progressively shifting the burden of saving, lending, and investing to individuals.

Knowledge of Islamic Financial Concepts

Islamic law governs IF and determines how financial transactions should be conducted (Nawi et al., 2018). Therefore, in this study, knowledge of the concept of IF covers the fundamentals of IF transactions across a range of IF products. Antara et al. (2016) defined two tiers of IFL; the first tier, similar to the general FL measure, refers to the understanding of basic financial concepts, while the second tier relates to the Islamic principles and mechanisms of Islamic financial instruments. Ahmad et al. (2020) also employed two dimensions of IFL but categorised these based on knowledge of Shariah compliance and of *riba* and profit-sharing. Md Sapir and Wan Ahmad (2020) found that university students who have taken muamalat-related courses obtain better FL scores. Similarly, Daradkah et al. (2020) found significant correlations between IFL and education levels and areas of study. Albaity and Rahman (2019) studied the concept of money lending in Islamic banks in compliance with Shariah – such as the profit/loss sharing method known as *musharakah*, lease banking (commonly called *ijarah*), and trade banking methods (commonly called *murabaha*) – and found that the level of IFL changes based on gender, income status, and work experience.

Saving and Investments

The next dimension of IFL considered in this study is saving and investing, which Huston (2010) defined as bringing present capital to the future by using various financial products such as saving accounts, equities, bonds, or mutual funds; this study focuses on the financial products that comply with Shariah principles. Vieira et al. (2018) found that financial knowledge positively impacts students' financial behaviours, including their abilities to set long-term goals and set aside money for future purchases and unforeseen expenses. Other studies have found that individual's saving behaviours are directly influenced by their financial knowledge and the emphasis placed on setting goals, controlling spending, and having financial reserves (Ibrahim et al., 2009; Zhu & Chou, 2020; Zulaihati et al., 2020).

Borrowing and Financing

In this study, borrowing and financing concerns knowledge of borrowing and financing through Shariah-compliant financial products, including the sale of debt, *murabahah, ijarah*, and bank loans. Borrowing is one of the four dimensions mentioned by Huston (2010) since FL is strongly associated with debt-related financial products such as credit cards, consumer loans, or mortgages; Nawi et al. (2018) also included borrowing as a dimension of IFL. Son and Park (2019) found that FL acts as a mediator between financial education and personal finance in both high- and middle-income groups. Md Sapir and Wan Ahmad (2020) found that when students were asked about the aim of borrowing, they responded that they would only borrow for emergencies and to meet fundamental needs rather than to satisfy material desires. Their attitude was based on Islamic doctrine, which views debt negatively due to its social repercussions and the risk of prolonged liability in the afterlife.

Financial Protection via Takaful or Insurance

The last dimension employed in this study is that of protecting resources by using insurance products or other risk management products that are aligned with Shariah principles; this dimension covers *riba* prohibition, speculation avoidance, *takaful* contributions, and *takaful* in general. *Takaful* is a protection scheme based on the principle of mutual assistance, which provides financial security to the scheme's participants in the event of future uncertainties manifesting (Alhabshi, 2012). Few studies have explored the concept of protection in the context of IFL, making this dimension an intriguing and novel area to be considered (Antara et al., 2017), especially in developing a comprehensive measure of IFL.

Methodology

Study Participants

The final instrument was distributed within a three-month period – using a convenience and snowballing method – to a total of 403 respondents from three samples: students (n=169), general working adults (n=123), and bankers (n=111). The sample size was determined using G-power based on our regression model of eleven predictors for the student sample and ten predictors for the general working adults/bankers' samples. We selected input parameters in G-power that were deemed appropriate – a medium effect size of 0.15, an α-value of 0.10 and a power of 0.8. The effect size of 0.15 was chosen based on prior social science studies focusing on financial behaviour that used the same criterion (*e.g.*, Azma et al., 2019; Mahdzan et al., 2023); the significance criterion or α size of 0.10 was chosen based on Cohen's (1992) recommendation for exploratory studies. After running these parameters *a priori*, the minimum sample size obtained was 102 and 98 for the student and the general working adults/bankers' samples, respectively. Thus, the sub-sample sizes obtained for each of the three groups were deemed acceptable. The purpose of having sub-samples was to test whether the IFL measurement could be used in Malaysia for diverse groups of respondents with different levels of exposure to Islamic banking and finance products. Students were recruited from a leading local public university, with a particular focus on those studying finance, business, and accounting. In the case of the general working adults and bankers, the questionnaire was distributed to employees working in the public and private sectors, including banks.

Instrument

The instrument used was an online, self-administered questionnaire comprising seven sections. The first section solicited information on the respondents' backgrounds, including gender, age, education, and occupational status. The remaining six sections included the six core IFL concepts (with a total of 36 items): general concepts, IF concepts, savings and investments, borrowing and financing, protection, and numeracy.

The Concept of IFL

IFL is conceptualised as a multifaceted construct consisting of different dimensions. Based on Nathie (2021), we identified factors relevant to IFL and suitable to the Malaysian context. We then mapped the items according to the six core concepts of IFL (see Table 1). The IFL score was computed using the number of correct

items divided by the total number of items in each section, given in the following formula:

IFL score: no.of correct items / total number of items

Table 1

Dimensions of IFL

Dimension	No. of Items	Description	Adapted from
General Concepts	6	Knowledge of general financial concepts such as inflation, exchange rate, risk, and return	Huston, 2010; Nawi et al., 2018; Albaity & Rahman, 2019
Numeracy and Computational Skills	7	Basic numeracy and computational skills such as addition, subtraction, division, multiplication, and time value of money	Baistaman et al., 2020; Lusardi & Mitchell, 2007; Lusardi & Mitchell, 2011b; Lusardi, 2012
Islamic Finance Concepts	7	Knowledge of Islamic finance concepts, including interest, riba, prohibited financial activities, and fundamental concepts	Md Sapir & Wan Ahmad (2020); Ahmad et al. (2020); Nawi et al. (2018); Antara et al. (2016)
Savings and Investments	7	Knowledge of Shariah-compliant savings and investments	Huston, 2010; Nawi et al. (2018); Ahmad et al. (2020); Antara et al. (2016)
Borrowing and Financing	3	Knowledge of Shariah-compliant borrowing and financing	Huston, 2010; Nawi et al. (2018); Md Sapir & Wan Ahmad (2020); Ahmad et al. (2020); Antara et al. (2016)
Financial Protection via Takaful or Insurance	6	Understanding of principles related to conventional insurance and takaful	Huston, 2010; Md Sapir & Wan Ahmad (2020); Nawi et al. (2018); Antara et al. (2016)

Preliminary Validation

We then performed a content validation of the instrument, soliciting seven experts in IF to provide feedback on four areas: consistency, representativeness of concepts, relevancy, and clarity of items. The feedback was on a scale ranging from 1, "not at all," to 100, "to a large extent". The average overall score for all dimensions was above 70%, and the experts highlighted items that required clarity and improvement. Based on advice, further refinements were then made to improve the clarity of the measures.

Next, a pilot study was conducted involving 43 working adults who had used Islamic financial services to ensure that they had some exposure to Islamic financial concepts. Based on the responses, minor adjustments were made to items viewed as redundant and ambiguous.

Results

For the final phase of validating the questionnaire, we tested the instrument on 403 respondents made up of students, working adults, and bankers. The findings are discussed in the subsequent subsections.

Demographic Characteristics

Table II shows the overall demographic characteristics of all three samples. In the student sample, most respondents were female, and more than half were Muslims. Approximately 50% were Malay, and another 43.2% were Chinese. The majority of the students were aged 25 years and below. Almost 86% of the students were enrolled in the fields of business, finance, and accountancy, and 63.9% were third-year students.

Among the general working adults, 56.1% were female and 43.9% were male. More than 80% of the respondents were Muslims and Malays. More than 10% were Buddhists and Chinese, and of these, 34.1% were young working adults in the 25–34 age group. Over half of the general working adults were degree holders, and 52% earned RM 4,000 and below.

For the banker sample, more than half of the respondents were men; 72% were Muslim, and 67.6% were Malay. As with students and general working adults, the majority of the respondents were Muslims and of Malay ethnicity. Those in the banker group were from slightly different age groups, with more than 54% in the

25–34 and 35–44 age groups. More than half of all respondents were degree holders, and 42.3% earned less than RM 4,000 and between RM 8,001 and RM 10,000 each month. The details are shown in Table II.

Table 2

Respondents' Demographic Characteristics

Variables	Students (n = 169)	General Working Adults (n = 123)	Bankers (n = 111)
	n[%]	n[%]	n[%]
Gender			
Male	52[30.80]	54[43.9]	51[54.1]
Female	117[69.2]	69[56.1]	60[45.9]
Religion			
Islam	88[52.1]	104[84.6]	80[72.1]
Buddhism	69[40.8]	14[11.4]	22[19.8]
Christianity	5[3]	3[2.4]	5[4.5]
Hinduism	6[3.6]	2[1.6]	2[1.8]
Others	1[0.6]	n/a	2[1.8]
Ethnicity			
Malay	84[49.7]	101[82.1]	75[67.6]
Chinese	73[43.2]	16[13]	24[21.6]
Indian	6[3.6]	3[2.4]	2[1.8]
Bumiputera	3[1.8]	2[1.6]	7[6.3]
Others	3[1.8]	1[0.8]	3[2.7]
Age			
Below 25	167[98.8]	14[11.4]	6[5.4]
25–34	2[1.2]	42[34.1]	29[26.1]
35–44	n/a	28[22.8]	32[28.8]
45–54	n/a	29[23.6]	38[34.2]
55 and above	n/a	10[8.1]	1[0.9]
Study programme			
Accounting	48[28.4]	n/a	n/a
Business	23[13.6]	n/a	n/a
Finance	79[46.7]	n/a	n/a

Others	25[14.3]	n/a	n/a
Year of study			
First year	9[5.3]	n/a	n/a
Second year	39[23.1]	n/a	n/a
Third year	108[63.9]	n/a	n/a
Fourth year	13[7.7]	n/a	n/a
Highest level of education			
Secondary level	n/a	13[10.6]	12[10.8]
Certificate level	n/a	4[3.3]	2[1.8]
Diploma	n/a	5[4.1]	9[8.1]
Bachelor	n/a	62[50.4]	59[53.2]
Postgraduate	n/a	33[26.8]	24[21.6]
Professional qualification	n/a	3[2.4]	5[4.5]
Monthly income			
Less than RM 4,000	n/a	64[52]	24[21.6]
RM 4,001–RM 6,000	n/a	14[11.4]	18[16.2]
RM 6,001–RM 8,000	n/a	18[14.6]	17[15.3]
RM 8,001–RM 10,000	n/a	1[0.8]	23[20.7]
RM 10,001–RM 12,000	n/a	9[7.3]	9[8.1]
RM 12,001 and above	n/a	8[6.5]	20[18.0]

Statistical Comparison

Table III shows a comparison of the IFL scores for the six core components and overall across the three groups. Students scored the highest in general concepts and numerical concepts (> 88%). They scored the lowest in three dimensions: saving and investment, borrowing and financing, and financial protection via *takaful*

or insurance (51% to 60%). This is unsurprising, as students would not have the income to invest and purchase *takaful*/insurance policies, and they are not eligible to apply for loans or financing. Hence, their understanding of these core concepts is very limited, acquired through the study of relevant subjects in their programmes.

The IFL results for general working adults were similar to those for students. They scored highest in the numeracy section (87%) and lowest in financial protection via *takaful* or insurance (58%). Bankers scored highest in numeracy (89%) and the lowest in borrowing and financing (63%).

Statistical results indicate a significant difference in the overall IFL scores between students, general working adults, and bankers (F-stats = 2.401, $p < 0.10$). The mean score for overall IFL was 74% for bankers and 70% for both students and general working adults. It is not surprising that bankers scored the highest overall IFL scores.

In regards to the six core concepts of IFL, we found a highly significant mean difference between the tested groups for financial protection via *takaful* or insurance (F-stat = 13.554, $p < 0.01$). The differences in scores for general and IF concepts were significant at the 10% level (F-Stats$_{General concepts}$ = 2.593; F-Stats$_{IF concepts}$ = 2.513). There were no significant differences, however, between the groups for three dimensions: saving and investment, borrowing and financing, and numeracy.

Table 3

Statistical Comparison of Groups Overall IFL Scores

	Items	Students (n = 169)	General Working Adults (n = 123)	Bankers (n = 111)	Statistical Comparison (F(df), sig)
General concepts	B1–B6	0.89	0.84	0.85	2.593 (0.076)*
Islamic finance concepts	C1–C7	0.74	0.73	0.78	2.513 (0.082)*
Saving and investments	D1–D7	0.64	0.65	0.67	1.592 (0.205)
Borrowing and financing	E1–E3	0.60	0.61	0.63	0.532 (0.588)
Financial protection	F1– F3	0.51	0.58	0.67	13.554 (0.000)***
Numeracy	G1–G7	0.88	0.87	0.89	0.374 (0.688)
Overall IFL score	B1–G7	0.70	0.70	0.74	2.401 (0.092)*

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Next, we compared the percentage of correct responses for each item within the six core concepts among the samples (see Table IV). The results show that most respondents answered most of the questions in the general and numerical sections correctly. Regarding IF concepts, the students answered 56.8% to 91.7% of the questions correctly. The lowest score (28.4%) was for Item 6–2 regarding the permissibility according to Shariah of trading in currencies. Of the general working adults, 62.6% to 94.3% correctly answered eight questions. However, less than half of the general working adults answered two questions incorrectly on the understanding of *riba* ("*C5: Can you pay your traffic fines or your tax bill with (say) RM 250 interest that you received?*") and the identification of Shariah-compliant trading activities ("*C6-2: Trading in currencies*"). Surprisingly, the bankers also performed poorly on Item 6–2. The remaining nine questions were answered correctly by the bankers, who scored between 60.4% and 89.2%.

For the eleven items in the saving and investments section, the range of correct answers for students was 55.6% to 95.9% and for general working adults, it was 62.6% to 96.7%. Both groups scored poorly, however, on Questions D1–D4, with correct answers ranging from 13.6% to 49.7%, and only 23.1% answered D5–6 accurately. The questions are as follows:

D1. Assuming that you invest RM 10,000 in an investment account, can you insist on receiving a fixed rate of return?

D2. When you place money in a Mudarabah Investment Account, you may lose money if the venture fails.

D3. When you deposit money in an Islamic deposit account, it is regarded as a loan, and your money is guaranteed.

D4. From a Shariah-compliant perspective, can you invest in government bonds?

D5–6. You have been working for over 20 years and now have some money to invest in the stock market. According to your understanding of Shariah compliance, which of these shares is prohibited or should be avoided? Select the ones you consider as non-Shariah compliant (you may select more than one): Insurance companies.

For bankers, the average score ranged from 52.3% to 96.4% for the savings and investment section. The lowest score, however, was reported for D1, D3, D4, and D5–6. Overall, over 85% of the respondents answered question D4 incorrectly, highlighting a general lack of awareness of the fact that government bonds are not Shariah-compliant investment instruments. More than 50% of the students and general working adults had difficulties understanding the underlying concept of *Mudarabah* and Islamic deposit accounts.

A smaller range (61.7%–74.8%) was observed for students and general working adults who managed to answer five questions correctly in the borrowing and financing section. Around 65% to 70% of the respondents in both groups failed to answer Question E3-4 correctly, and nearly half gave incorrect responses to Question E3–2. Both groups had problems gauging whether *Ijarah* and *Ar-Rahnu* are suitable financing tools for equipment costs for the following question:

E3. Assume you need to buy computer equipment that costs RM 10,000 but only has RM 1,500. RM 8,500 is required to acquire the equipment. Select all those methods that are Shariah-compliant that you will consider purchasing the equipment (you may select more than one).

As expected, bankers did not face any issues in answering all seven questions in this section, scoring between 54.1% and 82%.

The final IFL core concept is in the financial protection category. Students and general working adults performed poorly, especially regarding questions F1–3, F2, and F3. The questions were as follows:

F1. Please indicate your understanding of takaful and insurance.

F1.3 General Takaful gives you cashback in the event of no claim.

F2. In takaful, the contributions collected by the takaful operator belong to the takaful operator, participants, policyholders, or takaful agents/the participants/ policyholders, and the takaful operator.

F3. In an insurance company, the premiums collected by the company belong to the company, policyholders, insurance agents, policyholders, and insurance companies.

Only 29% and 36.6% of students and general working adults, respectively, answered correctly that the general *takaful* gave policyholders cashback in the event of no claim. Almost 70% of the students and more than half of the general working adults gave the wrong answer to the question related to the concept of *takaful* contribution/insurance premiums. Between 30.9% and 74.6% answered the remaining three questions correctly, with much higher scores for general working adults. The results also show that bankers recorded a high score for all protection, *takaful*, and insurance items, except for items related to *takaful* contributions. This is not surprising, as their scope of work does not require them to be well-versed in this concept. The findings in Table IV suggest that the concept of *takaful* contribution is the most challenging for respondents.

Table 4

Percentage of Correct Answers for Items by Core Concept[1]

	Range of correct answers						
	Items	Student (n = 169)		General Working Adults (n = 123)		Bankers (n = 111)	
		n	%	n	%	n	%
General concepts	B1–B6	137–159	81.1–91.1	95–110	77.2–89.4	78–102	70.3–91.9
IF concepts	C1–C7	48–163	28.4–96.4	48–111	39–90.2	31–107	27.9–96.4
Saving and investments	D1–D7	23–162	13.6–95.9	24–119	19.5–96.7	17–107	15.3–96.4
Borrowing and financing	E1–E3	51–125	30.2–74	43–92	35–74.8	62–92	55.9–82.9
Financial protection	F1– F3	49–126	29–74.6	45–96	36.6–78	55–95	49.5–85.6
Numeracy	G1–G7	97–158	57.4–93.5	65–116	52.8–94.3	56–107	50.5–96.4

Multivariate Analyses for the Determinants of IFL

Next, we performed a multivariate analysis to determine the factors that influence each of the six core concepts and the overall IFL. We used select respondent characteristics/demographic variables as independent variables based on a one-way analysis of variance and Tukey's post hoc tests.[2]

For the student sample (n = 169), we ran multiple regression analyses using gender, ethnic group, study programme, and year of study as independent variables (see Table 4). The literacy scores for borrowing, financing, saving, and investments were significantly higher for male than for female students (borrowing and financing: $\beta = 0.124$, $p < 0.01$; savings and investments: $\beta = 0.046$. $p < 0.1$). The scores for literacy and overall IFL were not significantly different for the two genders.

Between Chinese and Malay students (the base group), there appear to be significant differences in the scores for most of the core concepts, except for savings and investments (Model 3). Compared to Malays, Chinese students had significantly higher literacy scores for general concepts (Model 1) and numeracy (Model 6) but lower scores for IF concepts, borrowing and financing, and financial protection via *takaful* or insurance (Models 2, 4, and 6, respectively). In terms of overall IFL (Model 7),

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1   The details of the results are available upon request.

2   Full results of one-way analysis of variance (ANOVA tests) are available upon request.

there appears to be no difference in the scores among those of different ethnicities. The score was only significantly lower among Indian than Malay students for one core concept – IF concepts. The remaining results for ethnic groups were insignificant.

In terms of the programme of study, it appears that the literacy scores for all core concepts except numeracy were significantly lower for students in all programmes relative to finance students (the base group). For the core concept of numeracy, only business students showed a significantly lower literacy score than finance students (see Model 6 in Table 4). Overall, the results suggest that, compared to other students, those majoring in finance have acquired more knowledge of IF concepts.

For year of study, most results were not significant, although there were marginal differences in the scores of first- and third-year students (the base group) for the core general concepts, savings and investments, and overall IFL. Relative to the third-year students, second-year students had a marginally lower score for IF concepts (β = –0.053, p < 0.1). Only one core concept revealed significant differences at the 1% level between first- and third-year students for the financial-protection category (β = –0.296, p < 0.01); there appears to be no significant difference between third- and fourth-year students for all scores.

Table 5

Multiple Regression Results (Student Sample)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	DV: General Concepts	DV: IF Concepts	DV: Saving and Investments	DV: Borrowing and Financing	DV: Financial Protection	DV: Numeracy	DV: Overall IFL
Gender							
Male	–0.010	0.005	0.046*	0.134***	0.020	–0.036	0.029
	(0.029)	(0.025)	(0.025)	(0.048)	(0.043)	(0.036)	(0.019)
Ethnicities							
Chinese	0.073***	–0.052**	0.015	–0.102**	–0.072*	0.126***	–0.003
	(0.027)	(0.023)	(0.023)	(0.046)	(0.041)	(0.034)	(0.018)
Indian	0.100	–0.126**	–0.046	–0.148	0.037	0.083	–0.033
	(0.068)	(0.058)	(0.057)	(0.114)	(0.101)	(0.084)	(0.045)
Bumiputera	0.097	0.050	0.144*	0.122	0.053	0.013	0.087
	(0.092)	(0.080)	(0.079)	(0.156)	(0.139)	(0.116)	(0.062)
Others	0.153*	0.122	0.200**	0.219	0.069	0.135	0.157**
	(0.092)	(0.079)	(0.078)	(0.155)	(0.138)	(0.114)	(0.062)

Programme							
Accounting	−0.089*** (0.029)	−0.197*** (0.027)	−0.187*** (0.027)	−0.364*** (0.053)	−0.265*** (0.047)	−0.058 (0.039)	−0.195*** (0.021)
Business	−0.181*** (0.038)	−0.169*** (0.033)	−0.149*** (0.033)	−0.337*** (0.066)	−0.250*** (0.058)	−0.154*** (0.049)	−0.193*** (0.026)
Others	−0.094** (0.046)	−0.120*** (0.040)	−0.110*** (0.040)	−0.408*** (0.078)	−0.216*** (0.070)	0.033 (0.058)	−0.144*** (0.031)
Year of Study							
First year	−0.110* (0.056)	0.013 (0.048)	−0.083* (0.047)	−0.001 (0.094)	−0.296*** (0.083)	−0.028 (0.069)	−0.072* (0.037)
Second year	−0.023 (0.033)	−0.053* (0.028)	−0.003 (0.028)	−0.010 (0.055)	−0.052 (0.049)	0.006 (0.041)	−0.021 (0.022)
Fourth year	0.009 (0.047)	−0.047 (0.040)	0.040 (0.040)	−0.073 (0.078)	−0.039 (0.070)	0.014 (0.058)	−0.009 (0.031)
R-square	0.246	0.338	0.344	0.327	0.245	0.172	0.459
Adj. R-square	0.193	0.292	0.298	0.280	0.192	0.114	0.421
F(sig)	4.460 (0.000)	6.775 (0.000)	7.153 (0.000)	4.237 (0.000)	3.920 (0.000)	3.249 (0.001)	9.893 (0.000)
n	169	169	169	169	169	169	169

Note: (i) Std. deviations are shown in parentheses. (ii) The base group for gender is male; for ethnicity, Malay; for programme of study, finance; and for year of study, third year. (iii) ***, **, and * denote significance levels of $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively.

We conducted similar regression analyses for general working adults (n = 123). Overall, the results were not significant, with a very low R-square (less than 0.14) for all models. The results suggest that the model fit is not acceptable and that the independent variables alone contribute little to explaining the dependent variable.[3] Thus, it can be concluded that the IFL scores among the general working public were not influenced by their background characteristics.

Table VI shows the results of the multivariate regressions for the six core concepts of IFL and the overall IFL for bankers (n = 111). The independent variables used were the same as those in the analysis of general working adults. There were some significant results; the literacy score for general concepts was significantly lower for males (β = −0.125, p < 0.01). The literacy scores for the other components were not significantly different between the two genders.

3   Full results are available upon request.

Table 6

Multiple Regression Results (Bankers Sample)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	DV: General Concepts	DV: IF Concepts	DV: Saving and Investments	DV: Borrowing and Financing	DV: Financial Protection	DV: Numeracy	DV: Overall IFL
Gender							
Male	−0.125***	−0.007	−0.009	0.010	0.053	−0.015	−0.011
	(0.041)	(0.035)	(0.036)	(0.050)	(0.053)	(0.038)	(0.030)
Ethnicities							
Chinese	−0.006	0.016	−0.046	−0.016	0.031	0.085*	0.005
	(0.051)	(0.043)	(0.045)	(0.062)	(0.065)	(0.046)	(0.037)
Indian	−0.223	−0.045	−0.083	−0.056	−0.460**	0.034	−0.099
	(0.141)	(0.119)	(0.124)	(0.172)	(0.180)	(0.129)	(0.103)
Bumiputera	0.028	−0.015	0.006	0.010	0.101	0.016	0.030
	(0.079)	(0.067)	(0.069)	(0.096)	(0.100)	(0.072)	(0.057)
Others	0.273**	0.094	0.041	0.228	0.150	0.226**	0.154*
	(0.122)	(0.103)	(0.107)	(0.148)	(0.155)	(0.111)	(0.089)
Education							
High school	−0.218***	−0.146**	−0.089	−0.279***	−0.227***	−0.167***	−0.176***
	(0.065)	(0.055)	(0.058)	(0.080)	(0.084)	(0.060)	(0.048)
Certificate level	0.058	−0.077	0.057	0.029	−0.103	0.096	0.025
	(0.143)	(0.121)	(0.126)	(0.174)	(0.183)	(0.131)	(0.104)
Diploma	−0.035	0.084	0.025	0.020	0.064	0.123*	0.030
	(0.074)	(0.063)	(0.065)	(0.090)	(0.095)	(0.068)	(0.054)
Postgraduate degree	0.103**	0.112***	0.084*	0.057	0.101	0.109**	0.085**
	(0.049)	(0.041)	(0.043)	(0.060)	(0.063)	(0.045)	(0.036)
Professional qualification	0.099	0.076	0.149*	−0.110	0.091	0.079	0.085
	(0.094)	(0.079)	(0.083)	(0.114)	(0.120)	(0.086)	(0.068)

R-square	0.248	0.171	0.127	0.147	0.176	0.179	0.214
Adj. R-square	0.172	0.088	0.039	0.062	0.094	0.097	0.135
F(sig)	3.292 (0.001)	2.067 (0.034)	1.451 (0.169)	1.724 (0.086)	2.140 (0.028)	2.184 (0.025)	2.716 (0.005)
n	111	111	111	111	111	111	111

Note: (i) Std. deviations are shown in parentheses. (ii) The base group for gender is male; for ethnicity, Malay; and for the highest education level, a bachelor's degree. (iii) ***, **, * denote significance levels of $p < 0.01$, $p < 0.05$, $p < 0.10$, respectively.

Table VI also shows that, compared to Malays (the base group), the literacy scores for financial protection were significantly lower for those of Indian ethnicity ($\beta = -0.460$, $p < 0.05$), while the literacy score for "Others" was significantly higher than for Malays for three components: general concepts ($\beta = 0.273$, $p < 0.05$), numeracy ($\beta = 0.226$, $p < 0.05$), and overall IFL ($\beta = 0.154$, $p < 0.1$). The results for the remaining ethnic groups were not statistically significant.

In terms of education, some independent variables showed significant results. Compared to those with a bachelor's degree (the base group), the literacy score for respondents with secondary school education was significantly lower for all components except for savings and investments, for which the result was insignificant. Compared to the base group, the literacy scores for all core concepts, except for borrowing and financing and financial protection via *takaful* or insurance, were significantly higher for those with postgraduate degrees. The results show that education plays an important role in the IFL scores of bankers.

Conclusion

We developed a comprehensive measure for IFL encompassing six core concepts: general concepts, numeracy and computational skills, knowledge of Islamic financial concepts, saving and investments, borrowing and financing, and financial protection via *takaful* or insurance. Our results reveal marginal differences in the scores for the general concepts and IF concepts. Students had the highest level of literacy regarding general concepts compared to bankers and working adults, likely because most were either business, finance, or accounting students with foundations in general finance concepts (e.g., interest and time value of money).

For IF concepts, the bankers scored highest, presumably due to Islamic banking and finance being prominent in the Malaysian dual financial system. The most

significant difference was the financial-protection score related to insurance or *takaful*, for which bankers had the highest score and students had the lowest. This is not surprising since students have the least exposure to insurance/*takaful* products since they have not joined the workforce. Generally, the bankers scored highest in all core concepts except the general concept, in which students scored highest.

The estimation results show that relative to finance students, other students had lower IFL scores for all core concepts. This shows that finance students are more knowledgeable since their programme of study includes IF courses. First-year students also had lower IFL scores than third-years. Compared to Malays, Chinese students had lower IFL scores for most core concepts; this is unsurprising, given that Malaysian Malays are predominantly Muslims. As for the group of general working adults, the results are significant, but only just; the results for bankers were more significant. One of the obvious results is that education level plays a significant role in determining the IFL of bankers. Thus, we can surmise that education plays an important role in instilling knowledge on the relevant subject matter. It can be presumed that bankers hold bachelor's degrees in related areas such as finance, banking, and economics, and it is thus not surprising that, among bankers, the level of IFL is higher than among high school graduates (the lowest level of educational attainment in the sample).

These results have two important implications for industry players and authorities governing IF. Our IFL measure, with its six core concepts, tests respondents' knowledge concerning all aspects of personal finances in specific and broad terms. Our mean difference test results reveal that students scored the lowest for the insurance protection component of IFL. The IFL score among these students could be improved if insurance service providers collaborated with the Malaysian Insurance Institute to organise a regular campaign and an annual insurance competition among university students. Such regular events would boost their understanding of the products and the role of insurance protection, leaving students better informed about the insurance products available in the market. Regarding bankers, our regression findings highlight that those who were high school graduates scored significantly lower than degree holders. Therefore, banks should have compulsory IFL courses ranging from beginner to advanced level for these high-school-leaver employees to enhance their overall understanding of IFL and further improve the quality of employee service in dealing with bank customers interested in using Islamic banking products.

We acknowledge the study's limitations. First, we attempted to construct a comprehensive measure of IFL, and this ultimately contained 36 items covering six core concepts. Some respondents commented on the length of the questionnaire and did not complete the entire survey, and their responses had to be discarded. The second limitation is that IF is a very specific area, not easily comprehended by the general public, particularly those not exposed to the subject matter. Thus, the data collection process took longer than anticipated – aggravated by Covid-19-related delays. Thus, the researchers had to make extra effort to obtain respondents willing to answer the survey.

We recommend that future researchers adopt the measure and apply it in different settings, such as customers of various financial services (Islamic banks, Islamic investments, Islamic financing, and others). The IFL measure could also be tested to determine its relationship with the adoption of different Islamic financial services and products. Future research could also test the IFL measure in Islamic countries to see its relevance and coherence as a universal measure of IFL.

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