

DEVELOPING A FINANCIAL LITERACY SCALE FOR ARAB CONTEXT: A CASE OF UNIVERSITY STUDENTS

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Abstract

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The present study develops a tool to measure financial literacy in the era of the post-COVID-19 pandemic while recognizing the challenges and changes posed by the pandemic. Investigating and validating it in the Arab context that lacked such measurement and a dire need for further exploration. It employed new financial concepts that emerged during and post-COVID-19 (e.g., e-wallet, emergency funds), besides adjusting some items from previous instruments (e.g., Yanto et al., 2021; Organisation for Economic Co-operation and Development [OECD], 2019). An electronic questionnaire was distributed among Jordanian universities students. 507 valid responses were retained. Of the sample, females, employed students, bachelor's degrees, and business and social science majors represent 51.7 percent, 36 percent, 78.5 percent, and 36.3 percent, respectively. A quantitative approach was conducted using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) via AMOS-SEM to validate the robustness of the model. The findings revealed that the EFA demonstrated 11 items with three factors retained for measuring financial literacy (FL) (knowledge, practice, and skills) agree with (Baistaman et al., 2020). Based on the CFA result, the model fits the indexes (CMIN/DF = 2.369, CFI = 0.985, GFI = 0.966, RMSEA = 0.052). The developed tool is approved in its context, and it would assist policymakers in obtaining information necessary to enhance government strategies, namely, the National Financial Inclusion Strategy.

Keywords: Financial Literacy, Financial Knowledge, Financial Skills, Financial Practice, Factor Analysis

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1. INTRODUCTION

Poverty and unemployment rates have been exacerbated in many countries, including Jordan, during the coronavirus pandemic due to the nationwide closure, the weak marketability to

find new jobs, job losses, the closure and bankruptcy of small and medium entrepreneurial enterprises, decrease in foreign direct investment (FDI), stagnant growth at 2.4%, and decrease in national export levels ("Government's economic priorities program 2021-2023", 2020, p. 1).

The poverty rate level of Jordan for the first quarter of 2022 reached 24.1%, according to what the Minister of Planning and International Cooperation — Nasser Al-Shraideh stated (Alanbat, 2022), whereas, the unemployment rate among males during the first quarter of 2022 was about 22.8% with an inflation rate of 3.59 according to data from the Department of Statistics (DoS, 2022). In 2020, the Jordanian economy has shrunk by 1.6%, fortunately, this impact has but a little effect compared with the neighboring countries (Fanack, 2021). Moreover, the number of accused financially indebted in Jordan has risen during the past five years to 13000 women.

The main challenge facing the government and the individuals is to develop the National Financial Inclusion Strategy and maintain financial health, respectively. The pandemic increased the financial stress and instability for many people in societies, which emphasizes how crucial it is to comprehend personal finance to handle such unforeseen circumstances. Consequently, individuals need to navigate issues such as loan repayment, managing reduced income, and exploring potential investments. Financial literacy (FL) can equip people with the tools and knowledge they need to make well-informed choices and reduce stress (Sconti, 2022). After COVID-19, financial literacy — which includes knowledge and comprehension of a range of financial topics including debt management, investing, and budgeting — has grown in significance for several reasons: 1) economic volatility, 2) increased financial stress, 3) changing financial landscapes, 4) the importance of saving and planning, and 5) digital financial services (Fornero et al., 2021).

Previous studies focus on studying financial concepts such as income, time value of money, saving/investment concepts, debt, interest, diversification, inflation, and insurance (e.g., Organisation for Economic Co-operation and Development [OECD], 2019; Antoni et al., 2020; Dewi et al., 2020; Riitsalu & Murakas, 2019; Lusardi, 2019; Nicolini et al., 2013; Huston, 2010). Skills that enable people to make rational decisions about financial resources, budget, and goals (e.g., Oteng, 2019; Jain, 2022; Mohammed, 2019; Hung et al., 2009; Dwiastanti, 2015; Kozubik et al., 2017; Thomasa & Subhashree, 2020; OECD, 2019; Van Nguyen et al., 2022).

This study emphasizes pandemic-relevant topics such as understanding government stimulus programs, managing financial risk during crises, emergency funds, and job instability. It also incorporates digital financial skills, online transactions, and remote working.

In addition, many researches produced scales to measure FL most of them focused on three dimensions of FL i.e., knowledge, behavior, and attitudes (e.g., Munisamy et al., 2022; Castaneda et al., 2022; Akin, 2021; Cude & Nicolini, 2014). The items that make up the knowledge dimension include questions that require performing mathematical operations, whether they are open-ended questions or multiple choices. It is known that “knowledge is theoretical”. Hence doing mathematical operations is a skill. Therefore, this paper tried to derive a new dimension, i.e., skill besides knowledge. In addition, behavior and

attitudes are interrelated therefore this study combines the feelings and experiences from attitude with actions and situations from behavior in a behavioral practice variable that forms the third dimension.

Furthermore, a key justification for this study is that there are not many studies that look at developing an instrument to measure financial literacy in the Arab world specifically in Jordan, and continue adjusting this instrument to adapt to the changing environment. Considering these, this study seeks to fill these gaps in the literature.

The rest of this paper is organized as follows. Section 2 examines the pertinent literature. Section 3 examines the methodology used to conduct empirical research to develop a tool to measure financial literacy. Section 4 presents the study's findings and Section 5 discusses and compares them to the findings of previous studies. Section 6 concludes the research.

2. LITERATURE REVIEW

The poor economic conditions of any society affect and are influenced by the level of financial literacy in that society. A decrease in income due to job loss, market volatility, and financial pressures caused by crises (Toumpalidou & Chatzikonstantinidou, 2023), including the COVID-19 crisis, leads to a greater focus on survival and resilience rather than efforts to improve financial literacy from the government side, while individuals found an urgent need to understand personal finance to overcome such risks. For countries experiencing continuous economic problems, as is the case in some Arab countries, including Jordan, it becomes difficult for people to escape financial difficulties and find themselves in a cycle of poverty due to their lack of necessary knowledge to save, invest, or make wise financial decisions that could lead to long-term economic improvement. People who lack FL may fall victim to predatory financial practices (i.e., high-interest loans, and payday lending) (Federal Deposit Insurance Corporation [FDIC], 2007), even when there are opportunities for upward mobility, a person's ability to improve their financial situation may be limited. This could exacerbate income inequality and impede global economic expansion (FDIC, 2007). Government policies and social safety nets can significantly reduce the effects of unfavorable economic conditions. However, people with poor FL might find it difficult to use these systems and get the help they require. Individuals with higher levels of FL may be better positioned to take advantage of fresh opportunities for investment, entrepreneurship, and career advancement when an economy emerges from a downturn. Those with poor financial literacy might pass up these chances.

Financial literacy is positively correlated with economic development (measured by gross domestic product [GDP] per capita shows a country's GDP divided by its total population per capita) and financial development. Better FL promotes more effective use of savings and higher rates of return, attracting more investment and fostering national development. As well, greater stock market participation and financial market depth may result from higher literacy. In addition, FL may improve

the policy environment for growth, rein in financial intermediaries, and increase confidence in the market economy (Bucci et al., 2022). Furthermore, Mishkin (2008) declared that more informed people would have probably made more cautious decisions, which would have reduced the harm to the economy. The national argument for economic education is based on the notion that better-informed citizens can make better economic policies. The decisions individuals make as consumers, investors, and individuals affect the overall economy. Similar findings were reported by Cherry and Vignoles (2020) that while many adults with low literacy levels can find employment, workers with higher literacy and skill levels have more opportunities for career and income growth. In addition, long-term economic growth can benefit from FL if the return on the financial sector is positively correlated with the amount invested in financial literacy or with its overall level (Bucci et al., 2022). Based on these results, the economic development in Jordan can be improved by promoting the FL.

Smith et al. (2021) indicated that good financial health enables a better quality of life that aids people and societies to cover their daily costs without worry, manage unexpected financial shocks, and prepare for the future with comfort. Without specific measures and interventions, however, financial exclusion, if coupled with solid inequality, will limit individuals' access to economic opportunities and thus create long-term climaxes, increasing people's exposure to significant risks and economic insecurity. Maswadeh (2011) concluded that the customers of Jordanian banks lack a financial culture at a societal level. Thus, Jordan attempted to increase FL and stimulate greater entrepreneurial awareness among youth by introducing a large-scale FL curriculum into Jordanian schools in 2016 as a part of a national financial inclusion strategy (Aljaouni et al., 2020).

Furthermore, the post-COVID-19 era has seen changes in a variety of financial landscapes, such as remote work, digital payments, and investment shifts. Individuals must adapt to these changes, and financial literacy is required to understand and use these new financial mechanisms. To navigate the potential risks associated with online transactions, investments, and digital banking, the increased reliance on digital financial services necessitates a certain level of financial literacy. Besides that, the global economic developments in the field of technology have led most banking sectors in the world to go too deep reforms and radical changes in the entity of their systems and mechanisms to direct competition and keep pace with economic changes, as the concept of banking services and their diversity changed with them, especially since persistence in the traditional approach no longer gives results. This has made electronic banking services become practical and realistic work in various banking units (Salam, 2019; Al-Bahi, 2016). Ismaeel and Ali (2019), Saeed and Helw (2018), and Al-Saegh (2017) emphasized the importance of FL in reaching a secure level in making financial and investment decisions as well as enabling individuals to deal with the wide-range renewable and modern technological financial

products in addition to enhancing the control of consumption behavior of the financial products.

Previous literature provided many definitions of the concept of FL so there is no unified and general definition. Appendix A provides a brief idea of these overlapping and somewhat convergent definitions. In many studies, we may find that there is a reciprocal use of FL, financial knowledge (KN), and financial education (FE). These concepts are different, and using them alternatively creates problems. Since FL is more comprehensive than financial education, financial knowledge must accompany the ability and confidence to implement the knowledge when making decisions to be considered FL (Huston, 2010). The definitions in Appendix A, focused on a set of issues; knowing financial concepts, competence, and confidence in making rational decisions, enhancing individual and societal financial well-being, ability to use knowledge and skills, and evaluating new and technological financial instruments. Van Nguyen et al. (2022), Akin (2021), Rieger (2020), and Atkinson and Messy (2011) determined FL dimensions as a combination of awareness, knowledge, skills, attitude, and behaviors. However, attitude and behavior are correlated. Moreover, attitude affects behavior (Potrich et al., 2016).

Most of the researchers displayed in (Appendix A) have agreed that knowledge is a core element of FL emphasizing that KN is an integral part of FL and differentiated between the two concepts considering that KN is concerned with the theoretical comprehension of financial topics (Van Nguyen et al., 2022; Jain, 2022; OECD, 2019; Antoni et al., 2020; Dewi et al., 2020; Thomasa & Subhashree, 2020; Lusardi, 2019). Mouna and Jarboui (2015) connected FL with the ability to obtain information, analyze, manage, and communicate about one's financial situation. Bhushan and Medury (2013) claimed that FL helps individuals to improve their level of understanding of financial matters enabling them to process financial information and make informed personal financial decisions. Huston (2010), Zait and Berteau (2014), and Bucher-Koenen et al. (2016) linked FL with the knowledge of basic financial concepts and investment decisions.

Knowledge alone is not sufficient to describe and implement the FL. Moreover, it requires behavior (the way knowledge is implemented to manage finances) and skill (the precision of doing things). Behavior consists of an individual's attitude and values. Krathwohl et al. (1973) studied attitude and value as two separate variables and concluded that this is the best way to maintain an effective decision that leads to a life of financial well-being. As for possessing the skill, it comes from practicing the behavior, which is what Simpson (1972) studied and called psychomotor behavior (skills).

The cognitive domain (mental) consists of (remembering, understanding, applying, analyzing, evaluating, and creating) (Vitt et al., 2000). According to Luthans et al. (2021), the behavior of an individual in the organization is a result of interaction between a set of factors some of which relate to the individual him/herself (e.g., values, attitudes, education, etc.) and others relate to the organization (e.g., structure, culture, communication, leadership, etc.) considering

the general environment (culture). This paper considers the practical behavior in the Arab culture as a second dimension, as one can use the attitude as a subdimension. Having the FL is not just about managing the savings account but also selecting the appropriate financial tool among many alternatives. Skills involving physical movement, coordination, and use of the motor-skill areas make up the third dimension. These abilities must be developed through practice and are evaluated based on their execution speed, accuracy, distance, procedures, or techniques. Then the researcher can define FL as the ability to know, remember, understand, and apply concepts, analyze the relative information, evaluate the options and circumstances to create decisions and manage financial affairs, use skills, and take actions based on a person's culture.

Another issue is a wide variation and inconsistency in measuring and assessing the dimensions of FL, which is confirmed by (Nicolini et al., 2013). Some measures could be considered somehow difficult and diverse (Potrich et al., 2016). It is evident from the literature review that the categorization of the dimensions and their measurement should be adapted to be more accurate for certain contexts.

The knowledge dimension of FL in this study refers to a person's capacity to grasp financial information and utilize it to make sound, smart financial decisions. This knowledge is associated with understanding financial concepts such as income, time value of money, saving/investment concepts, debt, interest, and insurance (OECD, 2019; Antoni et al., 2020; Dewi et al., 2020; Nicolini et al., 2013). Riitsalu and Murakas (2019) found that subjective knowledge that is knowledge of money matters has a higher correlation with financial well-being than objective knowledge. Lusardi (2019) identified three concepts to measure FL that are numeracy, understanding inflation, and understanding risk diversification. In this study, FL was measured considering the four concepts identified by Huston (2010) categorized knowledge dimension into four types of concepts (basic, borrowing, saving/investment, and protection).

The skills dimension has been recognized by many researchers (e.g., Hung et al., 2009; Dwiastanti, 2015; Kozubik et al., 2017; Thomasa & Subhashree, 2020; OECD, 2019; Van Nguyen et al., 2022). Oteng (2019) and Jain (2022) relate FL to the skills that enable people to make rational decisions concerning their financial resources. Mohammed (2019) identified FL with the skills required to make sound financial decisions based on one's budget and goals. OECD (2019, p.19) asserted that the skills dimension includes "generic cognitive processes such as accessing information, comparing and contrasting, extrapolating and evaluating — applied in a financial context". Dwiastanti (2015, p. 101) illustrated that the "skills" dimension of FL is essential to achieve the financial aims based on the ability to "acquire, understand and evaluate relevant information". In this study, the definition of financial skills is based on the Consumer Financial Protection Bureau (CFPB, 2018, p. 2) which reflects "the individual's ability to find, process, and act on financial information" quickly and accurately.

The practice dimension has been highlighted by Shih and Ke (2014) who concluded that experience

regularly influences financial decisions; this finding supported the results of Sohn et al. (2012). Potrich et al. (2016) refer to the practice as used, defining it as the management of personal financial knowledge that is combined with understanding to form FL. Kozubik et al. (2017) linked FL with competence in specific practical situations translated into certain practices revealed in their questionnaire. Dewi et al. (2020) differentiated between two types of practice or behavior, i.e., positive practices reflected in managing cash, making saving provisions for emergencies, etc. while negative practices include being a spendthrift, relying on employer pension plans, etc. The practice dimension of FL in this study refers to the set of procedures performed to develop or achieve the personal financial goals of the students involving cash management, emergency savings, credit management, retirement plans, risk management, and estate planning (Robb & Woodyard, 2011) modifying some statements to suit the Jordan context.

Additionally, the lack of studies that applied to Jordanian and Arab contexts (Al-Saegh, 2017; Sarsour, 2018; Al-Sabti, 2020; Issa, 2020; Ghayad & Shayya, 2022) makes it more urgent to investigate which dimensions are more viable in this context. The context of the study represented Jordanian universities which represent a large portion of Jordanian citizens. Moreover, this sector is the future foundation of the Jordanian economy. Therefore, realizing its weaknesses or shortcomings in terms of financial literacy will enhance future economic growth and affect the development process in Jordan in general.

Moreover, the Union of Arab Banks (UoAB, 2017) has indicated that the Arab world still lags behind many regions in the world where there is still great potential to raise levels of FL and literacy, "as only 30% of the adult population in Arab countries has adequate FL" (p. 20). This study will provide the decision-makers in Jordan and the Arab World with a tool to assess and enhance the FL of their citizens to make regulations and modifications in the laws to adapt to the real level of their citizens' FL which results in better economic growth and reducing financial problems of the individuals. Dwiastanti (2015) stresses the importance of FL to manage financial difficulties as well as to enable the person to make savvy financial decisions, while Molchan (2022) provides examples of the importance of FL at the national level.

Investigating FL among youths is especially essential since they are at a transitional time in their life, transitioning from parental supervision to managing their finances (Shim et al., 2009; Shih & Ke, 2014). Financial habits formed during those years can carry over into later years, influencing students' lives economically, socially, and even emotionally, while also laying the groundwork for the future (Sohn et al., 2012). FL is important for youth to understand and implement as they are either consumers or future employers because the markets and consumers shift to digital (Burchi et al., 2021).

In the post-COVID-19 era, increasing financial literacy is crucial for helping people and communities manage their money wisely, adjust to shifting market conditions, and make wise financial decisions. Consequently, this enhances economic

stability and resilience at the individual and societal levels (Fornero et al., 2021; Baistaman, et al., 2020).

Therefore, this research pursues to develop a tool to measure FL among Jordanian university students since there is but a little attempt to measure it in Arab countries, and there is a need to evaluate the Jordanian government’s efforts and projects to elevate FL among the youth in Jordan such as National Financial Inclusion Strategy for Jordan 2018-2020 (Central Bank of Jordan [CBJ], 2021). Nevertheless, the importance of this topic for the well-being of individuals in society has been doubled due to the emergence of many modern technological financial products as well as the risks resulting from the unstable investment environment.

3. RESEARCH METHODOLOGY

3.1. Research sample

This research paper adapted the cross-sectional research design to obtain data for field study. This study investigated a stratified random sample of 507 university students studying at Jordanian universities, particularly from Mutah University who responded to the electronic questionnaire via Google form, distributed through the e-learning system. The reasons for choosing university students as a study population are that students are subject to

the financial literacy curriculum that was approved for teaching in Jordan starting in 2016, and university students have obligations that require making decisions that express their financial independence, and the results of these decisions relate to their well-being and security (Potrich et al., 2016; Mendes-Da-Silva, 2012). Mutah University is one of the largest universities in Jordan that provides both undergraduate degrees as well as postgraduate degrees in 63 various majors. Mutah University has a total of 21,163 students (QS, 2023). The sample included different categories such as gender, educational level, study major, and academic degree. It was observed that there is no missing data. Table 1 shows the population of the study (N), the study sample (n), and the percentage of each category from the total sample (%). It is revealed that the sample reflects approximately the percentage of the population. This survey of 507 is valid. The 51.7% of the students are female. The majority of the respondents are registering for bachelor’s degrees 78.5% and 41.6% are in the second year of their academic program. The participants were scattered between the academic majors equally which will facilitate the comparison study. Approximately 64% of the respondents are students without work while 36% of them are employed by someone.

Table 1. Frequency statistics of the study sample

Category		N	n	%	Category		N	n	%
Academic major	Business & social sciences	7,623	184	36.3	Education level	1rst	5,290	141	27.8
	IT & engineering	6,730	167	32.9		2nd	7,407	211	41.6
	Science & medicine	6,810	156	30.8		3rd	4,655	100	19.7
	Total	21,163	507	100		4th	3,811	55	10.9
				Total		21,163	507	100	
Gender	Female	11,200	262	51.7	University degree	Bachelor	18,647	398	78.5
	Male	9,963	245	48.3		Postgraduate studies	2,516	109	21.5
	Total	21,163	507	100		Total	21,163	507	100
Work	Employed		183	36.1					
	Unemployed		324	63.9					
	Total		507	100					

Source: Author’s elaboration.

3.2. The study instrument

Since there is no operationally valid instrument to model FL in the Arab context, this research evaluated the FT using various dimensions by reviewing various models and definitions presented in Appendix A. The concept of FL revolves around three axes: knowledge, skills, and practice (behavior and attitude). Therefore, this study will investigate them as study variables.

This questionnaire was developed to measure the three dimensions of FL. Each dimension is represented by 12 statements with one statement in negative form (marked *). The statements are arranged in the form randomly. The tool was presented in a Google form and delivered between February and March 2023. Also, it included some social, economic, and demographic variables related to students such as gender, employment status, academic major, and university degree. The current study will not include such variables in the analysis, but they will be investigated later.

Questions relating to knowledge (KN) derived from the “eight basic financial subjects which are division, time value of money, interest paid loan, calculation of interest plus principle, compound interest, risk and return, the definition of inflation and diversification” mentioned in Akin (2021, p. 102) and new terminology appeared during COVID-19 such as government stimulus program, and emergency fund. The items of this dimension were adapted from the work of Yanto et al. (2021) and Huston (2010) and improved to suit university students in Jordan’s context and the era of COVID-19. The items relating to tax, government stimulus programs, and emergency funds are newly formulated. The concept of knowledge refers to familiarity with information and theoretical concepts. It can be acquired through observation and study. Knowledge can be transferred from one person to another, or it can be self-acquired. Knowing the right answers is an example.

Skills are practical. They are the actions people take to put their knowledge into practice. Knowledge refers to familiarity with information, but skills refer

to the ability to apply knowledge to specific situations. You can acquire knowledge through education, whereas gaining skills often requires practice. It extended to be confident and efficient in making accurate and quick responses. Financial skill is how and when to find to process trustworthy information, and how to execute financial decisions and adapt adjustments as needed to stay on course. Skills items adapted from the financial skill scale of the Bureau of Consumer Financial Protection (CFPB 2018). Items related to government stimulus programs, decisions regarding unstable work, and emergency funds are newly formulated.

Financial practice relates to budgeting, planning, and managing (OECD, 2020), and comparing finances. To model financial practices that convey values, norms, and attitudes of Jordanian students through intended behavior, the scales used in Robb and Woodyard (2011), Cude and Nicolini (2014), and OECD (2019) have been used and tailored to fit the Jordanian context and the uncertain conditions. The practice dimension pertains to topics of credit, allocation, consumption, savings, and investments. New items were created to cover current topics such as remote work and e-wallet, e-banking, and electronic services. This instrument was composed of 30 questions followed the five-point Likert scale (never = 1, once in a while = 2, sometimes = 3, most of the time = 4, and always = 5). The high score in each dimension indicates a good FL. The developed and completed questionnaire is found in Appendix B.

This study used an electronic survey over the other tools since it is useful for studying attitudes, opinions, behaviors, and demographics. It provides plenty of data in a short time and suits the objective of this research. It efficiently collects quantitative data from a large and diverse sample. There are other qualitative ways to conduct such a study provided that the age of the respondent is 18-79 years (OECD, 2011). The personal interview, whether by telephone, teleconference, video conference, or face-to-face, is used to fill out a structural questionnaire. Interviews must be conducted at various times of the day and throughout the week. Certain groups of people, such as the elderly, housewives, students, or the unemployed, are much more likely to participate than in a truly random sample, and the results may be biased. Observation research is useful for comprehending real-world behavior, interactions, and patterns, but does not serve to get the respondents' knowledge. A qualitative approach can be used to extract new variables that affect FL (Firli, 2017). Financial knowledge exams with problems varied from easy to more difficult. It suits examining more informed people (i.e., Atkinson & Messy, 2011). Many types of scales found to measure FL questionnaire-based scales, knowledge-based scales, scenario-based scales, performance-based scales, true/false scales, self-assessment scales, objective measures, and standardized tests (Akin, 2021). Generally, a questionnaire is a common way of FL measurement (Akin, 2021; Potrich, 2016;

Lusardi et al., 2019). However, the large size of the sample makes it more suitable to utilize a questionnaire-based scale. Also, it can be used the scale built by Lusardi and Mitchell (2008, 2011a, 2011b). These scales were built and applied in other contexts rather than Arabs.

This study employed the cross-sectional study to investigate the pandemic period, while other research may benefit from longitudinal research to study changes and developments over time. In addition, this study used the structural equation model to analyze the factors while Bongini et al. (2018) used item response theory (IRT) and classification and regression tree analysis (CART) as alternative data analysis methods to treat the survey data.

4. RESULTS

The normality of the observed variables was detected and approved since none of them was significantly skewed or highly kurtotic. The data provided by SPSS v. 23 showed that skewness of the observed variable lies in the range of (0.108 to 1.788) and kurtosis lies in the range of (-1.418 to 2.411), so one could consider that these observed variables follow normal distribution since both are within the range of absolute 2.0 and 7.0 respectively (Hahs-Vaughn, 2017). The linearity of the observed variables was assessed using scatter plots from which it was confirmed that all observed variables are linearly distributed. In addition, there appeared no outlier significantly affecting the observed variables. Dimension reduction analysis of "varimax components analysis with extraction method" was explained utilizing the correlation matrix. Table 2 illustrates the results of Kaiser-Meyer-Olkin (KMO) and Bartlett's test. The value of the indicators of this test equal 0.796 with ($p > 0.05$) indicating that the correlations are adequate for factor analysis as well and none of the variables are significantly correlated (Meyers et al., 2006).

Table 2. KMO and Bartlett's test

<i>Bartlett's test of sphericity</i>			<i>Kaiser-Meyer-Olkin measure of sampling adequacy</i>
<i>Approx. Chi-square</i>	<i>df</i>	<i>Sig</i>	
3,650.242	55	0.000	0.796

Source: Author's elaboration.

The exploratory factor analysis (EFA) demonstrated the researcher's suggestion for selecting three factors (groups) for measuring FL as shown by the screen plot, it is evident from the graph that the curve starts to flatten at component 4 as well and the eigenvalue of component 4 is less than 1. The classification of the factors suggested by the researcher will provide aid to intensify the efforts provided by Jordanian authorities to raise financial awareness among such an important class of population i.e., university students.

Figure 1. Screen plot for FL construct

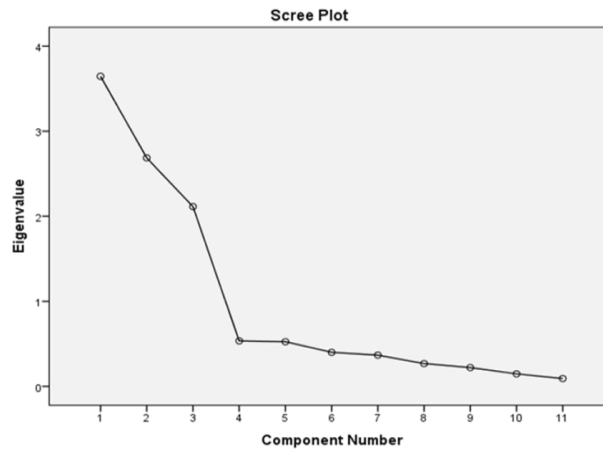


Table 3 demonstrates the three factors extracted by the dimension reduction analysis where the eigenvalues are greater than one. The eigenvalues obtained are in the range of (2.320 to 3.370), the variance explained by the first factor (financial knowledge [KN]) equals 30.634%; the second factor (financial skills [SK]) equals

25.042%; the third factor (financial practice [PR]) equals 21.092%. The total variance explained for measuring this construct equals 76.768%. Given that, it was higher than the necessary minimum of 60%, the total variance explained is acceptable (Hair et al., 2019).

Table 3. Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.645	33.139	33.139	3.645	33.139	33.139	3.370	30.634	30.634
2	2.686	24.415	57.555	2.686	24.415	57.555	2.755	25.042	55.676
3	2.113	19.213	76.768	2.113	19.213	76.768	2.320	21.092	76.768
4	0.534	4.858	81.626						
5	0.524	4.768	86.393						
6	0.400	3.636	90.029						
7	0.367	3.339	93.368						
8	0.268	2.439	95.807						
9	0.221	2.011	97.818						
10	0.147	1.340	99.158						
11	0.093	0.842	100.000						

Note: Extraction method: principal component analysis.
Source: Author's elaboration.

Table 4 illustrates the rotated component matrix where principal components analysis with varimax rotation was conducted to assess how the three factors (components) are clustered. The loadings of each of the 11 items are presented in the table and are greater than 0.6 (Hahs-Vaughn, 2017) so that they all enter the model. Factor (component) one consists of five items (Q19, Q23, Q21, Q22, and Q20), factor two consists of three items (Q26, Q27, and Q28) and factor three consist of three items (Q1, Q2, and Q30) as well.

Cronbach's alpha test (Table 5) was performed to validate the internal consistency of the items of the construct. The value of the test (as a whole) equals 0.873 which is greater than 0.7 (Hair et al., 2019) then the items of the tools meet the reliability requirements. Cronbach's alpha for the subscales of the factors KN, SK, and PR are 0.877, 0.953, and 0.844 respectively, and is greater than 0.7. Henceforth the construct shows acceptable reliability.

Table 4. Rotated component matrix^a

Items	Component		
	1	2	3
Q19	0.871		
Q23	0.847		
Q21	0.841		
Q22	0.768		
Q20	0.753		
Q26		0.962	
Q27		0.961	
Q28		0.947	
Q2			0.887
Q1			0.886
Q30			0.846

Note: a. Extraction method: principal component analysis.
Source: Author's elaboration.

Table 5. Reliability analysis

Factor	All	KN	SK	PR
Cronbach's alpha	0.873	0.877	0.953	0.844

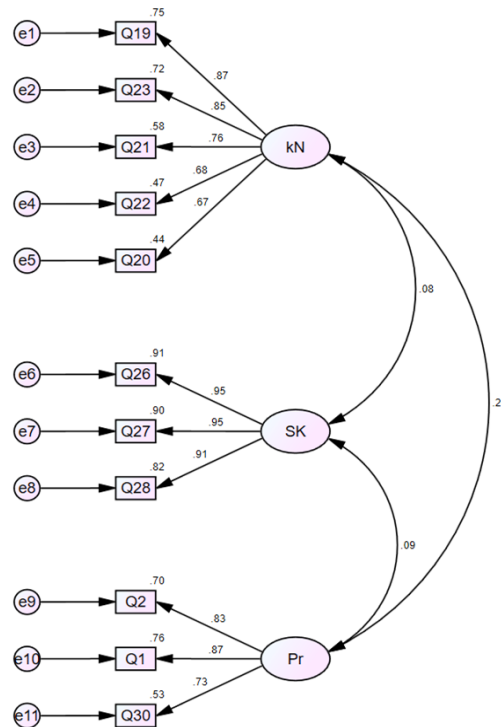
Source: Author's elaboration.

Figure 2 represents the confirmatory factor analysis (CFA) of the study based on the criteria of maximum likelihood according to the multivariate

normality criteria of the items. The exploratory factor analysis allowed the selection of 11 items among the items presented in the tool of the study. The master validity of the model indicators is presented in Table 6 illustrates that the model presents no validity concerns. Given that the composite reliability (CR) for factor 1, factor 2,

and factor 3 are 0.878, 0.955, and 0.853 respectively and all are greater than 0.7, as well as the average variance extracted (AVE) for factor 1, factor 2, and factor 3 are 0.593, 0.877, and 0.661, respectively and all are greater than 0.5, the measurement model has convergent validity (Hair et al., 2019). Moreover, CR < AVE thus convergent validity is ensured.

Figure 2. CFA model of the study (standardized estimation)



To ensure the discriminant validity of the construct the following conditions should be met:

- AVE < MSV (maximum shared variances);
- AVE < ASV (average shared variances);
- AVE is greater than the corresponding inter-construct correlations associated with that factor (Hair et al., 2019).

From Table 6, it is evident that the knowledge factor AVE equals 0.593 which is greater than (MSV = 0.039 and ASV = 0.0196), as well correlation coefficient for this factor equals 0.770 which is greater than (AVE = 0.593). For the skills factor, AVE

equals 0.877 which is greater than (MSV = 0.008 and ASV = 0.007225), and the good correlation coefficient for this factor equals 0.936 which is greater than (AVE = 0.877). For the practice factor, AVE equals 0.661 which is greater than (MSV = 0.039 and ASV = 0.021025), and well correlation coefficient for this factor equals 0.813 which is greater than (AVE = 0.661). Consequently, one could be assured that the measures of this construct are not correlated with outside other measures as well are not highly correlated to each other. Henceforth, the model has no validity concern.

Table 6. Master validity of the model

	CR	AVE	MSV	ASV	MaxR(H)	KN	SK	PR
KN	0.878	0.593	0.039	0.0196	0.896	0.770		
SK	0.955	0.877	0.008	0.007225	0.959	0.079	0.936	
PR	0.853	0.661	0.039	0.021025	0.867	0.196***	0.091†	0.813

Note: Significance of correlations: † p < 0.100, * p < 0.050, ** p < 0.010, *** p < 0.001, thresholds from (Hu & Bentler, 1999) and (Brown, 2015).

Source: Author's elaboration.

Confirmatory factor analysis (CFA) output showed that the model is recursive with a sample size of 507. The model contains 30 various items, 11 of them. The observed items are (Q19, Q23, Q21, Q22, Q20, Q26, Q27, Q28, Q2, Q1, and Q30). While the unobserved items include (KN, e1, e2, e3, e4, e5, SK, e6, e7, e8, PR, e9, e10, and e11). The standardized factor loadings in CFA are

displayed in Figure 2. The specified structural model contains three factors, including "Knowledge", "Skills", and "Practice". The factor loadings of these subscales ranged from 0.667 to 0.866 for the "Knowledge" subscale, 0.906 to 0.952 for the "Skills" subscale, and 0.727 to 0.834 for the "Practice" subscale.

Moreover, the number of distinct sample moments equals 66 and the number of distinct parameters to be estimated equals 25. So, the degrees of freedom of the model equals 41. Henceforth, the minimum requirements for the Amos Package have been achieved with Chi-square equals 97.122 and a probability level of 0.000.

To check the fitness of the model, certain measures were considered: CMIN/DF = 2.369; GFI = 0.966; AGFI = 0.945; NFI = 0.975; RFI = 0.965; IFI = 0.985; TLI = 0.979; CFI = 0.985; RMSEA = 0.052; RMR = 0.03; PGFI = 0.600, and PNFI = 0.726. So, these values represent an acceptable and excellent measure compared with the cutoff values in Table 8. It is worth noting that all other important indices meet the standard fitting criteria of model fitness as shown in Table 7, indicating that the proposed model has met the requirements to be an accepted model for measuring FL of the students of Mutah University.

Table 7. Model fit measures

Measure	Estimate	Threshold	Interpretation
CMIN	97.122	-	-
DF	41	-	-
CMIN/DF	2.369	Between 1 and 3	Excellent
GFI	0.966	Between 0 and 1	Excellent
CFI	0.985	> 0.95	Excellent
SRMR	0.032	< 0.08	Excellent
RMSEA	0.052	< 0.06	Excellent
PClose	0.382	> 0.05	Excellent

Source: Author's elaboration.

Table 8. Cutoff criteria (Hu & Bentler, 1999)

Measure	Terrible	Acceptable	Excellent
CMIN/DF	> 5	> 3	> 1
GFI			> 0.9
CFI	< 0.90	< 0.95	> 0.95
SRMR	> 0.10	> 0.08	< 0.08
RMSEA	> 0.08	> 0.06	< 0.06
PClose	< 0.01	< 0.05	> 0.05

Source: Author's elaboration.

5. DISCUSSION

In this study, the researcher uses EFA to develop a screening procedure that enables data improvement and validation (Hair et al., 2019). The EFA was carried out utilizing SPSS version 23. The Kaiser-Meyer-Olkin (KMO) results were $0.796 > 0.50$. The variables are valid for factor analysis, as evidenced by the value discovered, so factor analysis was done. In addition, 3,650.242 passes Bartlett's test of sphericity. This is significant, indicating that a factor analysis should be carried out because at least three variables are linked (Hair et al., 2019). The 30-item questionnaire was validated using exploratory factor analysis. After using the factorial analysis by principal component with varimax rotation, only 11 items with three factors were retained. Even though only one-third of the items were retained, those questions can still represent each factor. Brown (2015) considers a factor with three items to be reliable. The three variables accounted for 76.768% of the total variance. The study also discovered a positive correlation ranging from 0.287 to 0.651. Using AMOS24, a confirmatory factorial analysis was conducted to assess the accuracy, convergent and

discriminant validity, construct validity, and validity of the measurement model Table 6. The model fit the indexes very well (CMIN/DF = 2.369, CFI = 0.985, GFI = 0.966, RMSEA = 0.052). Cronbach's alpha estimates of internal consistency are deemed adequate for each factor. The factors entered in the model: *Knowledge*, *Skills*, and *Practice* agree with the previous studies (Hung et al., 2009; Thomasa & Subhashree, 2020; Baistaman et al., 2020; Akande et al., 2023).

This study conducted the university students in Jordan. Most of the respondents, 78%, are students in bachelor's programs which reflects the ratio in the population. It was found that 69% of the sample was in the first and second year of their program. There is a positive relationship between the level of education and FL. The higher the education level, the higher FL. Female students constitute 52% of the study sample, which was distributed closely among various academic majors. Interestingly, 36% of the study sample has jobs. Before four years, most of the respondents were at the high school level and they could have been influenced by educational losses during COVID-19, it is noticed that the students do not consider the finance curriculum seriously since it is not included in the national exam. These issues may consider reasons for eliminating the 19 items of the initial questionnaire 14 of them relate to the skills and practices that are not experienced because of moving restrictions and the remaining five items are related to the knowledge that was missed because of the mentioned reasons. In Lusardi and Mitchel (2008), OECD (2016), and Akin (2021), females scored higher than males on the FL which is considered an advantage for the well-being of society, also the employed people scored better than the unemployed ones.

In practice, Jordanian university students' financial behavior demonstrates their capacity to set long-term goals, budget their incomes, and make confident decisions. This behavior is directly affected by questions about basic subjects in finances (i.e., inflation, risk and return, and the characteristics of financial products), as well as by the value placed on practicing norms through price haggling and using one's abilities to adopt new financial applications and seek advice.

This study bridges the gaps that appeared in the Arab context where most of the studies concentrated on financial awareness (Mouna & Jarboui, 2015; Al-Sa'eg & Ali, 2018; Aljaouni et al., 2020; Al-Sabti, 2020; Essa, 2020) have mainly focused on KN. This study pursued to validate a model to measure FL for a sample of Jordanian university students that could be utilized for Arab university students. In addition, this study linked the dimensions of FL with Bloom's taxonomy.

6. CONCLUSION

The difficulties faced by the economic situation that the society has been inserted in require self-sufficient and responsible persons. FL plays a master role in having successful people through owning the financial knowledge and skills that form the framework that empowers people to confidently practice and manage their financial affairs. Gaining this importance, the developed construct was

designed to validate an instrument to measure and enhance the FL among university students. It was developed based on several previous instruments and modified by the researcher to suit the Jordanian higher education context and Arab culture; it also adds items concerning the new concepts and financial and social tools that became viral during and post-COVID-19 era. Moreover, the developed scale provides an important building block for enhancing the efforts by the Jordanian government to raise financial awareness and apply more thrust to face issues of unemployment and poverty in Jordan. As well as this study also adopted structural equations modelling to validate a robust model for FL. This model can be used for future research as a base for dynamic design to evolve post-pandemic, allowing for adjustments in the measurement over time.

According to the findings of this study, financial literacy is an individual's process of recognizing financial knowledge that will be employed in financial decision-making supported by the skills gained through life and the practice of financial matters. Governments and other parties must develop FL to improve business sustainability during different economic conditions (Yanto et al., 2022). The researcher will present the developed scale to decision-makers in Jordan to evaluate financial culture courses at the secondary or university level to implement the required modification on the curriculum by incorporating educational materials addressing post-COVID financial issues into financial literacy programs to assist individuals in preparing to navigate the new financial landscape. Enacting or amending legislation regarding granting tax exemptions for

remote work in compensation for workers bearing additional expenses related to providing a productive remote work environment (inside the home).

The results lead to the conclusion that the designed instrument is valid for measuring FL through three dimensions. There is a lack of knowledge of interest rates, and expenditures, and a lack of practice in consumption, credit, remote work, tax, emergency fund, and stimulus programs. It needs effective action to maintain this problem. The researcher recommends investigating the relationship between FL dimensions and the demographic variables and between knowledgeable people and non-knowledgeable because questions varied in difficulty for more insights about the situation that is the next step of the research since the data is available in the questionnaire form.

The results of this study are limited since it used cross-sectional research and designed a static measurement to grasp the uncertainty condition; future research may use longitudinal research by designing a dynamic measurement for studying changes and developments over time. It is important to mention that the questionnaire was distributed to all government universities in Jordan. However, because of the weak responses, it was eliminated. The data collected from students at Mutah University which is located in the southern part of Jordan was kept. Therefore, it is useful for such a study to be conducted and managed by a governmental body such as the Central Bank of Jordan to determine the FL situation and implement the financial inclusion plan. Researchers may use a combination of data collection methods to enhance the reliability and validity of their research.

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APPENDIX A. LIST OF DEFINITIONS

Table A.1. Financial literacy definitions

No.	Reference	Definition
1	Vitt et al. (2000, p. 12)	"The ability to read, analyze, manage, and communicate about the personal financial conditions that affect material well-being".
2	Schagen et al. (1996)	The competence to undertake rational, informed judgments about money management.
3	Mandell (2007, pp. 163-164)	"The ability to evaluate the new and complex financial instruments and make informed judgments about both: choices of instruments and extent of use that would be in their own best long-run interest".
4	JumpStart Coalition (n.d., as cited in President's Advisory Council on Financial Literacy, 2008, p. 36)	"The ability to use knowledge and skills to manage one's financial resources effectively for lifetime financial security".
5	Hung et al. (2009)	Knowledge of basic economic and financial concepts, as well as the ability to use that knowledge and other financial skills to manage financial resources effectively for a lifetime of financial well-being.
6	Remund (2010, p. 284)	"Is a measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate, short-term decision-making and sound, long-range financial planning, while mindful of life events and changing economic conditions".
7	Jain (2022), Norman (2010, p. 200)	A set of skills and knowledge that allows an individual to make informed decisions through their understanding of finances. "The set of skills and knowledge that allow an individual to make informed and effective decisions through their understanding of finances".
8	OECD (2011, p. 3) OECD (2013, as cited in Van Nguyen et al., 2022)	"A combination of awareness, knowledge, skills, attitude, and behaviors that" essential to "make sound financial decisions and ultimately achieve individual financial well-being". A set of awareness, knowledge, skill, attitude, and behavior needed to make suitable financial decisions and attain individual financial well-being.
9	Harrison (2016)	Understanding financial information and using it to manage one's finances through both short-term decision-making and long-term financial planning.
10	OECD (2019, p. 18)	"Knowledge and understanding of financial concepts and risks, as well as the skills and attitudes to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life".
11	Kozubikova (2015, as cited in Kozubik et al., 2017, p. 43)	Using a person's ability to make a qualified judgment based on his/her knowledge, skills, and experience to maintain balanced financial security throughout life.
12	Ahmad et al. (2019, p. 21)	"The knowledge of facts, concepts, principals, as well as technological tools which are the basics of management of income and savings".
13	Thomasa and Subhashree (2020, p. 482)	"Having the knowledge, skills and confidence to manage personal finance and enterprise finance".
14	Bagci and Kahraman (2019, p. 492)	"The ability of an individual to take informed decisions on basic financial practices".
15	Akin (2021), Castaneda et al. (2022)	Three unchanging and essential components of FL are financial knowledge, financial behavior, and financial attitude.
16	Munisamy et al. (2022)	A multi-dimensional construct to measure financial well-being and make sound financial decisions comprised of knowledge, attitude, and behavior.
17	Baistaman et al. (2020)	"The capability to make sound financial decisions including dimensions of knowledge of financial concepts, ability to communicate financial decisions, aptitude, skills, and confidence in financial planning".
18	Akande et al. (2023)	"As (a) a specific form of knowledge, (b) the ability or skills to apply that knowledge, (c) perceived knowledge, (d) good financial behavior and even (e) financial experience".

APPENDIX B. THE STUDY INSTRUMENT

Table B.1. The study tool

Q	Dimension	Statement
Q1	PR10	I can manage my credit card well.
Q2	PR7	I divide the money for personal and educational purposes.
Q3	KN3	Buying a single company stock usually provides a safer return than a stock mutual fund. *
Q4	PR2	I pay my Bills on time using e-banking and/or electronic payment services.
Q5	SK3	I struggle to understand financial information. *
Q6	PR5	Having to work (study) remotely added expenses that put pressure on my budget (Internet, laptop, etc.).
Q7	PR6	I do in practice prioritize spending on my needs overspending on my wants.
Q8	PR1	I usually use the e-wallet to pay my family's liabilities. *
Q9	KN10	Given the amount borrowed and the interest rate, I can calculate the interest paid over.
Q10	SK2	I know how to get myself to follow through on my financial intentions.
Q11	KN7	A decrease in taxable income will lead to a decrease in tax revenues because of countries affected by the coronavirus pandemic.
Q12	SK10	I can deal with the financial statement easily.
Q13	KN5	I know how to calculate the average of my annual expenses.
Q14	PR9	I compare interest rates when I am considering a financial product.
Q15	SK5	I know how to keep myself from spending too much.
Q16	SK6	I can manage my debts through diverse debt resources to face uncertainty.
Q17	KN9	a) I understand the Jordanian government stimulus program (e.g., Sanad App. for digital identity). b) I learned about the importance of emergency funds during the coronavirus crisis.
Q18	PR8	I do my best to save for my future needs considering unexpected events.
Q19	SK1	I know how to make complex financial decisions related to the unstable job I have during COVID-19.
Q20	KN1	High inflation means that the cost of living is increasing rapidly.
Q21	KN6	I can select the most important features of a financial product to consider when making choices (i.e., APR).
Q22	KN4	An investment with a high return is likely to be high risk.
Q23	KN8	Imagine five brothers are given a gift of £100. The brothers must share the money equally. If they have to wait one year to get their share of £100. In one year, they will be able to buy less than they can now.
Q24	KN2	It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares.
Q25	PR3	I check my account statement regularly using the e-bank service.
Q26	SK8	I can deal with Mobile Financial Applications.
Q27	SK9	I can find the advice I need to make decisions involving money quickly.
Q28	SK7	I can make good financial decisions that are new to me regarding my electronic financial portfolio.
Q29	SK4	I can reorganize my work (firm) to benefit from the government stimulus program.
Q30	PR4	I compare prices before purchasing by visiting the suppliers' websites.

Note: * Negative question. Confirmed items are color-marked.

Source: Author's elaboration.