



Robo-Advisor Can Play a Role in Promoting Financial Knowledge Within Society

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ABSTRACT

This research investigates the role of artificial intelligence, specifically Robo advisors, in society's financial knowledge. Previous studies have mainly focused on the role of Robo advisors in investment decision-making aspects. However, this study focuses on how Robo advisors can facilitate learning in six critical areas of financial planning, both Islamic and conventional. These areas include retirement planning, investment planning, tax and zakat planning, risk management planning, retirement planning, and estate planning. The study interviewed various stakeholders, including bankers, financial education trainers, financial advisors, and members of society. The goal was to gain a comprehensive understanding of the digitization of financial knowledge and the implementation of robo-advisors. The findings reveal that Robo-advisors have the potential to stimulate interest in financial knowledge, particularly if they serve as gateways to a range of financial advisory services and act as tools for providing basic-level financial advice and information sharing. The convenience factor allows individuals to access initial insights into financial knowledge at their preferred time and location. Overall, this study significantly contributes to the advancement of financial education.

1. Introduction

Financial knowledge is essential because it has been found to shape individuals' financial attitudes and behaviors [1, 2]. It has also been found to contribute to individuals' financial stability when they manage their wealth effectively [3]. The main challenges in society regarding financial management include the inability to understand financial concepts and risks, which can lead to wrong decision-making and worsen someone's financial condition [4]. In addition, Islamic financial planning knowledge is crucial in Malaysia due to the complexity of Islamic banking products and services offered by various institutions, and it is considered vital because it provides knowledge and

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understanding of Islamic financial services institutions, products, and services offered [4, 5]. Besides, Financial education in Malaysia is currently offered in a traditional way, such as in school or university subjects. The latest development is the introduction of the Malaysian National Financial Literacy Strategy 2019-2022 by the government in 2019 [7]. The National Strategy also led to the implementation of a new policy, the Financial Sector Blueprint 2022-2026 [8]. This blueprint also focuses on the use of digital technology to enhance the accessibility of information to education and share awareness about financial knowledge. Nevertheless, there is no particular emphasis on financial education via digital platforms like artificial intelligence. Nonetheless, the financial market in Malaysia is advancing towards the digital era.

The use of artificial intelligence, such as robo advisors, as investment tools has been widely accepted in the market. However, can robo-advisors also contribute as tools to encourage society to learn financial knowledge? Financial decision-making and wealth management encompass more than just investment decisions; they should also include decisions such as savings, wealth protection, wealth purification, and wealth distribution. Therefore, this study explores the potential of implementing the role of robo-advisor in this context.

2. Literature Review

2.1 Robo- Advisor in Malaysia

Robo advisors are relatively new in Malaysia. Previously, Malaysia had three licensed and fully operational robo-advisors: StashAway, MyTHEO, and Wahed. In the latest development of 2020, the Securities Commission approved two more robo-advisor platforms, Raiz and Robo Wealth. Wahed, an American-based platform, was the first Shariah-compliant robo-advisor to become available in Malaysia [9]. This trend highlights the growing prevalence of technology-based financial consulting in the Malaysian market. Robo-advisory investment options are readily accessible to their users. Robo-advisors are automated platforms that provide individual investors with online portfolio management and investment advice. They use technology to translate investing principles into easy-to-use interfaces, allowing investors to create and execute investment strategies with little or no interaction with a financial professional. Robo-advisors offer features such as goal-based investing, socially responsible investing, and innovative beta strategies. They have been found to perform well during market downturns and have increased tax-loss harvesting activity during these periods. The awareness and perception of robo-advisors among individual investors vary, with factors such as cost-effectiveness, trust, data security, and behavioral biases influencing their perception. Using robo-advisory services has positively influenced investment decision-making but may not fully mitigate behavioral biases. The adoption of robo-advisors has increased middle-class households' participation in financial markets and improved their welfare through better diversification [3, 5, 8-10].

2.2 Robo Advisor and Financial Knowledge

Robo-advisors have emerged as an alternative for individuals who are not inclined to pay for a financial advisor [11]. Selecting a financial advisor involves considering an individual's financial capacity and current financial status, which encompasses aspects such as a significant income and greater wealth [12, 13]. These factors are crucial in determining the ability to pay professional fees. In China, digital financial products are utilized by the financially inclusive population, contributing to an enhancement in their financial literacy and knowledge [14]. Similarly, Morgan *et al.*, [16] suggest the necessity of formulating digital financial education strategies and programs within G20 countries

to empower consumers to effectively utilize financial technology (Fintech) products and prevent fraud and costly errors. Thus, comprehending financial behavior through financial education is explicitly undertaken to refine the understanding of human behavior and create specific tools.

Furthermore, it can be argued that this understanding will be valuable for professionals such as financial educators' financial planners, and financial counselors. Users of Robo-advisors are generally found to have lower income and net worth; some among them even possess less inheritance and display fewer impulsive financial tendencies [16]. Additionally, Fulk *et al.*, [17] discovered that Robo-advisory clients in the US have an average age in their mid-40s, indicating that users are not exclusively millennials, and that engagement extends to individuals within the financially inclusive group. Consequently, the utilization of robo-advisors in financial education remains relatively unexplored. This research will explore the potential utilization of robo-advisors as tools for financial education that cover all six steps of financial planning activities. These steps include savings and financing planning, investment planning, tax and zakat planning, retirement planning, and estate planning. This study will encompass both conventional and Islamic financial knowledge.

3. Methodology

This study uses an exploratory research design where in-depth interviews and focus group discussions were used to understand the potential of using robo-advisors as tools to encourage society to learn financial knowledge. Incorporating qualitative research methods can significantly enhance the understanding of financial knowledge [17, 18]. By utilizing these approaches, finance researchers are able to explore the complex reasoning behind conversations and expand their empirical sources of data to include individuals' perspectives [19]. This can provide valuable insights and supplement existing research practices in the field of finance [20]. Engaging in qualitative methods can supplement the future direction of finance research, which is currently limited by a narrow focus on quantitative methods [21]. The participants, as shown in Table 1, the interview included three bankers, three financial advisors, three financial education trainers, two fintech company representatives, and four individual users (society). The data from the in-depth interviews were analyzed using thematic analysis in Atlas.ti 23 software.

Table 1
Numbers of participants

Participants	Numbers	Code
Bankers	3	P1-P3
Financial advisors	3	P4-P6
Financial education trainers	3	P7-P9
Fintech company staffs	2	P10-11
Individual Users/ Society	4	P12-P15
Total Participants	15	

4. Results

4.1 The Digitalisation of Financial Education

A question was asked to understand the potential impact of digitalization on financial education: 'What do you think about the digitalization of financial literacy education?' All participants were asked for their opinions and feedback on digitalization from their roles, as presented in Table 2. Thematic analysis was used to generate themes and codes. Five themes have been identified to

represent the results. These themes are adaptation, automation, digital transformation, preference for paid programs, and face-to-face communication. All these themes are presented in Figure 1.

Table 2
 Perspectives on the digitalization of financial literacy education.

Questions	Role	Participants/Code	Response	Themes	
What do you think about the digitalization of financial literacy education? (Q1)	Bankers	P1	“Indeed, now most banks have gone to digitalization. This means customers don’t need to come to the bank, and they can open an account from home.”	Digital transformation: technology advancement,	
		P2	“Using FT, Financial Terminal, they can directly access their account. So, they don’t need to go to the bank, pay bills and so on....”	Adaptation: Convenience	
		P3	“Because now everything is done on the website or ATM machine. When customers can’t reach the centre or the branch, they can do it themselves, so they can reduce the risk to the bank. When they don’t call us, they do it themselves, so the risk is on the customer...”	Adaptation: quality maintenance, Automation	
	Financial advisors	P4	“Before this, I focused a lot on Perak only. But nowadays, I have my team in KL, Kedah due to digitalization, but the quality needs to be maintained...”	Adaptation: quality maintenance, Digital transformation: digitalization	
		P5	“The effect that I see with social media there are many finance influencers that try to give their opinion. From there, the public's awareness increases. For example, people might start investing in gold, property, or takaful. We cannot deny that this comes from digitalization...”	Digital transformation: digitalization, Face-to-face communication: social media, Preference paid program	
	Financial education trainers	P6	P6	“They started to be okay with online classes, and they even felt better because they could make comparisons. When it’s like that, the quality of delivery factor is also important. So, actually, it’s good, good that causes us not to play around in giving delivery to the community...”	Adaptation, Preference paid program
				“See that you are moving towards digitalization because of the advancement of IR 4.0 due to the pandemic. If we choose to blend at our intuition, we remain facilitated by assisted learning...Uang FL. We can conduct physical discussions as well as through webinars and we have also developed a new online learning Portal.”	Adaptation, Digital transformation: digitalization: technology advancement
		P8	P8	“You know you have to embrace this, the digitization’s uh, especially say you wanted to do literacy for the young	Digitalization: technology advancement

		people... Actually, even more often you know and there can be including more family members in the. Don't meet, you know OK and even children from overseas can join. So, when they do the financial plan they can explain in such a way that I think definitely even the profession is actually embracing digitization..."	
	P9	"As well as, uh, eLearning, OK, they mean there will be more options coming through in the near future. So other than that, I do believe that they must be consistent and continuous..."	Adaptation: uncertainty, Adaptation: quality maintenance
Fintech company staffs	P10	"There is an advertisement there, so from there, when people click, but whether they read or not we can't control, we don't know, but hopefully it will reach them..."	Adaptation: uncertainty, Automation: lack of control
	P11	"... that one has a good because maybe of the nature of the information and the main of that data on the on the website and also easy access, but the app maybe people are not familiar with it. So, we are having some kind of challenge to push more this..."	Preference paid programs: lack of familiarity
Individual users/ Society	P12	"Because, as I mentioned before, young people in the city have problems in terms of time to seek knowledge, there are problems in terms of time... It is a necessity to spread information digitally. It's not just about chatting online, the information we get and do digitally also needs to be disseminated..."	Digital transformation: digitalization
	P13	"If I am also uncomfortable when approached, especially if it is paid, but maybe I will change my mind if the issue and content are about the latest issues.... I prefer face to face because there are many things that can be distinguished from online because online is more limited."	Preference paid programs: discomfort with approaching, face-to face communication.
	P14	"For me, I don't think I would join because I already have the basics and maybe if it's paid, I won't go. I also prefer face to face because there are fewer distractions. If it's online, I'm more easily distracted..."	Face-to-face communication.
	P15	"For me, I prefer online learning because I may be less exposed to an environment where parents' education always tells us to save and invest somewhere..... My friends' experiences are the same, each	Digital transformation: digitalization, Face-to-face communication, social media,

discussing the importance of takaful and insurance. I also prefer YouTube and Telegram, there is a group where they will share and update about finance....”

Adaptation:
Convenience

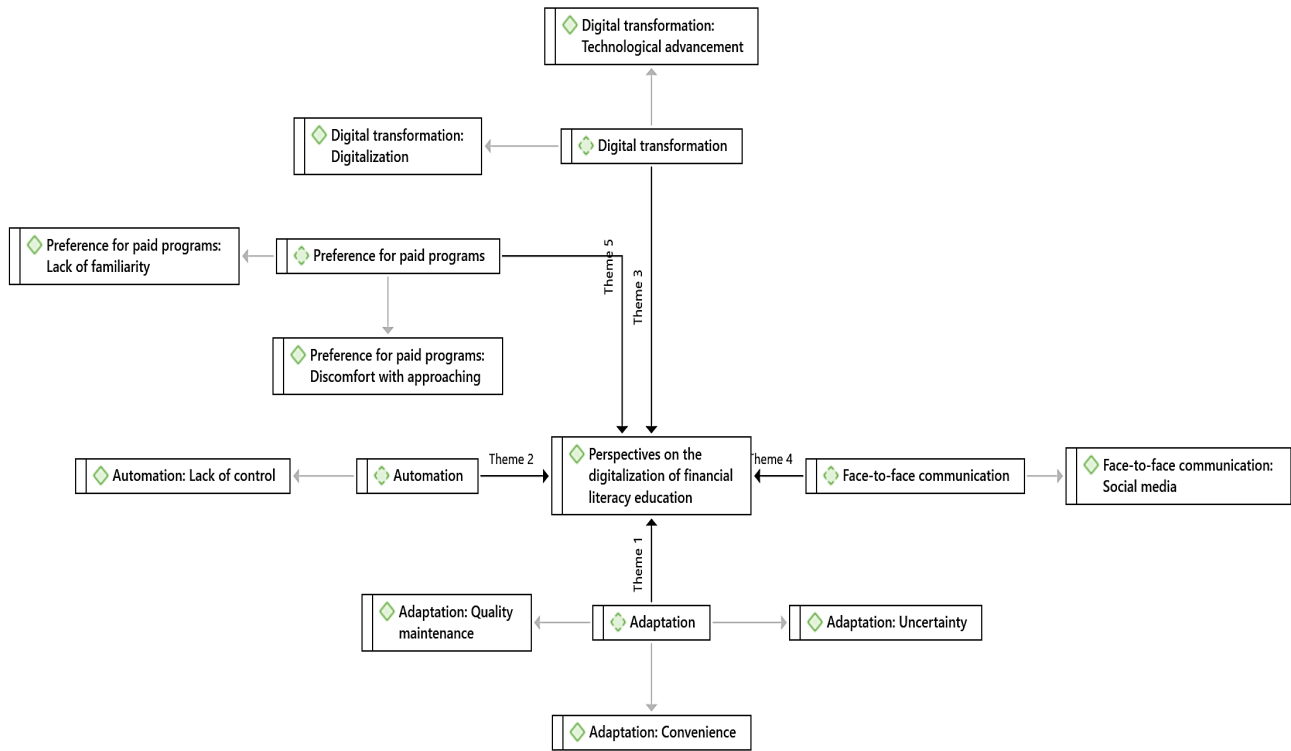


Fig. 1. Themes identified contribute to the perspective on the digitalization of financial literacy education

From Table 2 and Figure 1, bankers (P1, P2, and P3) argued that it is important for financial education to go digital since financial products in Malaysia are currently moving towards digitalization. Financial advisors in this study showed that digitalization contributes to broader prospects and increases awareness of financial knowledge through social media, for instance. The financial advisor's perspective (P6) is consistent with those of two financial trainers (P7 and P9), who state that digitalization offers more options for individuals to acquire financial knowledge. Hence, digitalization provides opportunities for individuals to learn about financial products, services, and strategies through online platforms and resources [22]. Both P10 and P11, who represent fintech company staff, indicate that digitalization offers convenience and broader prospects to them. The challenge is that both companies provide financial knowledge and information through mobile applications. However, this method requires more promotion to increase awareness among society about the existence of their apps. In addition, the generation gap also contributes to the preference of the platform chosen by individuals. P12 suggests that the young generation prefers to use digital platforms to learn, which agrees with the statement given by P15. P15 is currently at the young age group. Previous studies also mention the new generation has so much information at their fingertips that it makes them more pragmatic and analytic in their decision making [23]. P13 and P14 fall under the young adult age group and prefer traditional methods of learning financial knowledge and free courses compared to P15. These findings also support the previous findings that even in the digital era, some people still find it difficult to use digital tools as learning platforms [24]. Therefore, it could be argued that the impact of digitalization on the financial services industry and the need for new

approaches to financial education [25]. Additionally, digital technology has become a compulsory and powerful tool for delivering education and accelerating the learning process [26]. The digitalization of financial knowledge through digital platforms has been found to contribute to opening a more expansive space for society to learn financial knowledge and help financial institutions and industries promote their services to broader prospects.

4.2 Robo-Advisor as A Tool for Financial Education

To explore the potential of robo-advisors as tools for financial education, the participants of this study were asked the following question: What do you think about the use of robo-advisors as a financial education tool? Four main themes were identified and generated using thematic analysis.

These themes are human interaction, uncertainty, technology, and support. From these main themes, there are sub-themes represented as sub-codes. For example, under human interaction, have the sub-theme experts. Technology has two sub-themes: emotional engagement and interest in technology; while under support, there is the sub-theme of support doubt. These themes and sub-themes are presented in Figure 2. Table 3 and Figure 2 show that, as bankers, both P1 and P3 state that robo-advisors help provide financial knowledge and information since most bank transactions are moving towards digitalization. They also suggest that at least a holistic robo-advisor can be treated as a one-stop centre for users to get information during bank non-working hours. In addition, P4, P5, and P6 suggest that a robo-advisor can be one of the tools for users to gather initial information regarding financial knowledge. However, since robo-advisors are detached from emotions, some emotion-attached decisions are difficult to advise. However, it can be argued that the robo-advisor can be a gatekeeper for individuals to start their financial knowledge learning process. It would be good if the robo-advisor suggested a financial advisor for advanced services. A previous study found that financial advisors are matched with wealthier, older investors rather than older, younger ones [27]. Meanwhile, users of robo-advisory services generally had lower incomes and net worths, received no or less inheritance, and were less impulsive financially [16]. Therefore, it can be suggested that the robo-advisor can be used as an attached tool to start financial and wealth management by learning through digitalization and showing inclusiveness among users of different backgrounds.

Table 3
 Perspectives on the use of robo-advisor as the financial education tool

Questions	Role	Participants/ Codes	Response	Themes
What do you think about the use of robo-advisors as a financial education tool? (Q2)	Bankers	P1	“That’s good, the content is good. Most banks already have a robo-advisor platform...” I think it’s good if everything is in one.”	Technology
		P2	“It’s the same, because that’s the product specialist department, so I’m not sure...”	Not sure about the Robo advisor
		P3	“Sometimes the people we want to approach don’t even know who they are. We have to search and survey So, it's good if everything is included, including Zakat, because there are people who save but don't know about Zakat.”	Technology
	Financial advisors	P4	“Robo-advisors are good, the reason they are good for society is that companies can reduce costs. But at the initial stage it’s okay, to enter the middle and final stages, there will be no problem if robo-advisors are implemented. But	Technology

		if the understanding or knowledge of financial management in society is higher, robo-advisors will be quite relevant to society at that time.”	
	P5	“I see that at the initial stage, it will happen. Because in managing finances, emotions play a big role, when it comes to robo-advisors, their weakness might be in terms of emotions. That’s right, they might be able to give suggestions based on the figures they get.”	Technology: emotional engagement
	P6	“This is an example, for instance, someone has a problem, at first, we think an app is okay, but it turns out that the human factor is more important.... I feel the same way about financial issues. AI or robo-advisors are good for helping at the initial stage, but as humans, we still need a human touch to ensure consistency.”	Human interaction, Technology: AI limitation
Financial education trainers	P7	“Actually, learning is about being effective. If you rely solely on technology, it’s more about technical technicality, you know, and then there are certain things that we can use technology 100% for. But in terms of learning, sometimes emotional engagement is needed because we are emotional beings and robots can’t do that. That’s why I agree with ...when he says that technology does not replace us”	Technology: Emotional engagement, Human interaction
	P8	“...OK. But would it encourage them to act with the digitization then there is still yet to see that and that is why I think of the... you need expert behind it. Otherwise, there is there is no action they at the level of knowing information is there, but we also have a risk of information overflow. So how that that will not actually will jeopardize the decision-making process.”	Human interaction: expert, Uncertainty
	P9	“...OK, at the same time we must be also aware, uh, the risk associated with the robo advisor...we must be aligned with the technology, but we. Let’s not forget the fundamentals of it...there must be a support system behind that”	Support: Doubt
Fintech company staffs	P10	"Okay, robo-advisor, I fully support this initiative. Very innovative. When there's an app that can answer questions like that, and there's also a robo-advisor that can provide free answers, all of this is free, no charges. When more is needed, then certain experts will step in." "It can be useful, but that stage is the initial stage. It is useful in terms of gathering input from that education to improve the robo-advisor, but it doesn't mean the robo-advisor becomes the final product."	Support, Human interaction
	P11	“...This is, let's say basic and let's say level 1 to 1 or 1 on 1. It could be useful and relevant”... “Islamic finance Sharia advisory, whereby the Sharia is a bit somehow, if it is presented in a complex cases, there is no straight forwards answer, and we don't know how sophisticated	Technology, Human interaction: expert

to capture the things and the facts and present these options to determine the Halal and the Haram which would be very challenging and it would be regarded as the first one, and I don't think so far actually have allowed the robo advisor to pronounce the Fatwa. But guidance? Guidance and what we're called advise definitely could be relevant..."

Individual users/ Society	P12	"Focus on everyone, but they can make a choice whether they want Islamic or conventional, so in my opinion, they can make it as one option, and because it will give us comfort in terms of our spending, maybe it has already been set, in terms of Shariah-compliant spending and so on, it has been differentiated so we know."	Human interaction: Expert, Support: doubt
	P13	"It's convenient, but when I tried to use ..., the alerts were not correct. I'm not sure, but for financial education, this might be the best...."	Uncertainty, Support: doubt
	P14	"It's very good to see everything is leaning forward towards AI and advanced technologies along with algorithms. But how accurate the algorithm is. But it can be improved...."	Technology: interest in technology
	P15	"For me, robo-advisors are good because when we sign up for some robo advisor, it will give us questions and financial planning. And it can also detect our category, whether aggressive or normal, and then it also gives advice. I think it's good because there are also benefits..."	Support: doubt, Human interaction

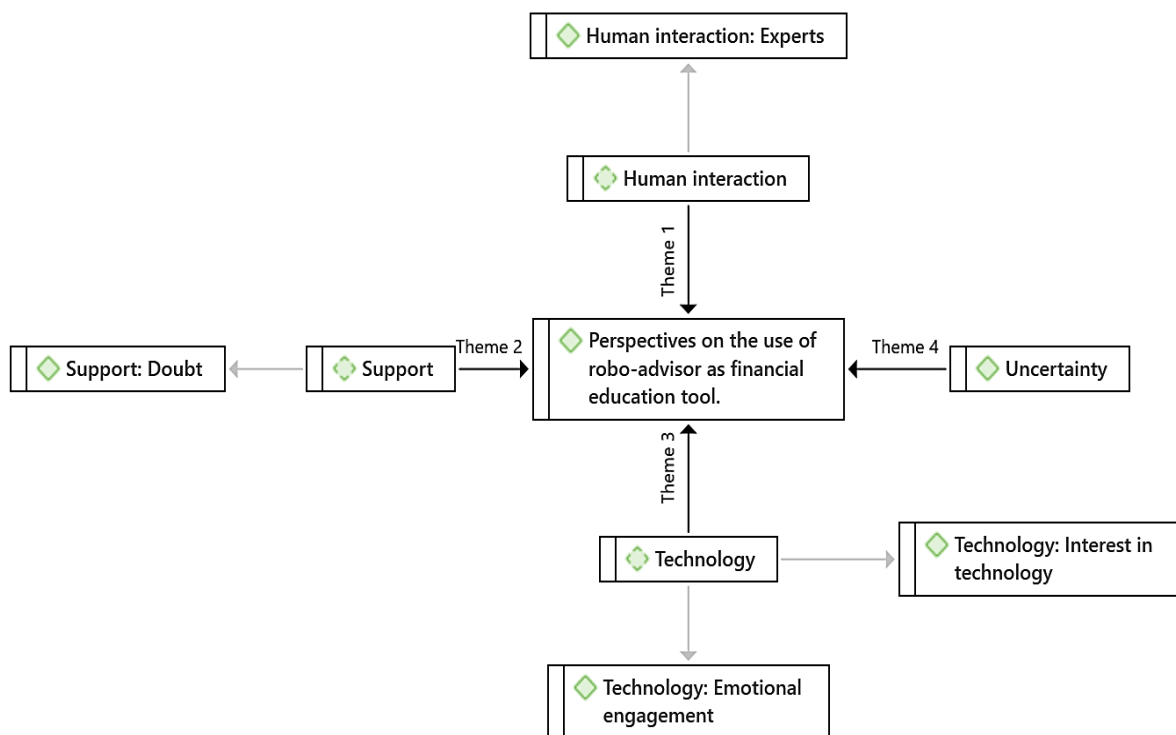


Fig. 2. Themes contribute to the use of robo-advisor as a financial education tool

However, the elements of professionalism and expertise need to be addressed regarding advanced advice, as suggested by P7, P8, and P9. This is also to ensure that the information related to financial knowledge is reliable and trusted, as mentioned by P13 and P14, even though it is just an initial tool to start the financial learning process. If this can be arranged properly, the suggestion by P12, which indicates the ability of robo-advisors as reference tools for comparing knowledge between Islamic and conventional finance, can be done. P15 stated that utilizing a robo-advisor can facilitate acquiring financial planning skills, particularly among young individuals. This is because the approach involves responding to user-generated queries, negating the requirement to search various platforms for straightforward advice.

5. Conclusions

The emergence of computerized financial advice presents a significant opportunity to provide accessible and affordable financial guidance to those seeking help with retirement planning, saving, investing, and asset decumulation. Digital financial education can be beneficial for millennials who wish to increase their knowledge about investing in the stock market, as financial literacy is known to contribute to their leaning to invest in the market [28]. Robo-advisors are essential in enhancing financial literacy and making financial advice more accessible. With the current digital challenge for financial products, which are becoming more complicated to understand, and digital, financial knowledge also needs to be provided digitally. It is suggested that robo-advisors be widely introduced by providing initial financial information and knowledge tools for society to access and engage with easily.

There is also a need for a human touch, with professionals needed to solve complex financial decisions. Introducing robo-advisors as a gateway for individuals, such as young people and those with lower incomes, might help them understand initial financial knowledge. Higher-income households are more likely to employ a financial advisor than lower-income households [29]. It would be good to have a one-stop center for robo-advisors that provides information regarding six areas of financial planning and wealth management knowledge, covering the entire financial decision-making process. The Utilization of advisors is associated with increased planning activities, awareness, and confidence [30].

In the height of risk and governance challenges surrounding digital finance [31], future studies could be extended from this perspective as well as to identify the readiness of different age groups to start using comprehensive financial knowledge robo-advisors and explore the development of robo-advisors in the financial industry today. This research advances the field of robo-advisors within wealth management and financial planning, providing valuable insights to stakeholders in the financial technology industry.

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