

THE ROLE OF DIGITAL TRANSFORMATION IN ENHANCING FINANCIAL LITERACY: AN ANALYTICAL STUDY OF THE OPINIONS OF A SAMPLE OF EMPLOYEES AT AL-FURAT AL-AWSAT TECHNICAL UNIVERSITY

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Abstract

This research focuses on the relation of digital transformation to employees' financial literacy at Al-Furat Al-Awsat Technical University. The research design was descriptive-analytical due to the use of the questionnaire containing 45 items across five factors of digital transformation and four factors of financial literacy in surveying 106 employees.

According to the results, the levels of digital transformation and financial literacy were found to be fairly high (means of 3.956 and 3.949 respectively). Reliability tests indicated very good internal consistency of the measure, as the values of Cronbach's alpha coefficients varied from 0.915 to 0.985. The correlation analysis provided evidence for the positive significance of the link between the factors of digital transformation and financial literacy ($r = 0.726$). The regression analysis proved that digital transformation is a good predictor of financial literacy ($\beta = 0.855$, $R^2 = 0.731$); the most important component is 'Digital Security and Risk Awareness' ($\beta = 0.835$).

The conclusion of the study states that digital transformation has an important role to play in improving financial literacy among university staff. It suggests that upgrading digital infrastructure must be made, digital literacy training programs must be designed, promotion of FinTech adoption among university staff, and further studies should be conducted related to the subject in multiple universities.

Keywords: Digital Transformation, Financial Literacy, FinTech Adoption, Digital Security, Interactive Financial Applications.

Introduction

In an age where technological developments are emerging rapidly and the world is becoming digitized, organizations must get with the times, as they will suffer in the long run if they do not. Digital transformation is one of the biggest trends nowadays, changing the way services are provided, operations are managed, and decisions are made. The banking sector is a good example of understandings of this process since banks and other companies dealing with finance have switched to online services that contribute to carrying out transactions. Such advancement is of great importance not only for the efficiency of the institution but also for the financial knowledge of people who use these services.

Financial literacy, which refers to the comprehension, skills, habits, and practices that empower people to make wise financial choices, is now a key competency in the complicated modern economic situation. With the surge in the use of digital finance, the query arises why one would need digital financial literacy. Workers in educational institutions, specifically universities, face the same challenges; they must control their finance in a digital finance world. It is quite important to know how digital transformation contributes to enhancement of financial literacy of this category of workers in order to develop appropriate solutions for facilitating financial well-being at the institutions.

The research at hand is centered on Al-Furat Al-Awsat Technical University studying the interdependence of digital transformation and financial literacy of the employees. The study attempts to ascertain the level of digital transformation at the workplace, how well-versed the employees are in the financial sphere, the extent to which digital transformation may influence the employees' financial literacy and how it can assist them in becoming financially savvy. This research examines five components of digital transformation: Digital Accessibility and Infrastructure, Digital Financial Literacy, FinTech Adoption, Digital Security and Risk Awareness, and Adoption of Interactive Financial Applications, and four components of financial literacy: Financial Knowledge, Financial Skills, Financial Position, and Financial Well-being. The outcome of this study is expected to indicate the relationship between the two terms. It will also provide practical recommendations on the implementation of digital transformation measures and enhancement of the financial literacy in an academic and administration sphere.

The first part: scientific research methodology

First: Research Problem

The research problem stems from the increased demand for understanding of how digital transformation helps improve the financial literacy of employees particularly in educational institutions (including A-furat Al-Awsat Technical University) due to widening the sphere of use of digital services and platforms as well as increasing their role in performing financial and administrative operations. Despite the importance of digital transformation basically for accessing financial information and resources, it is still unclear how it helps to achieve an improvement in the financial literacy of employees, which brings up the questions about the nature and extent of this impact and its dimension. Therefore, an analytical research on the views of a sample of employees at the university should be conducted to determine how useful a digital transformation could be in increasing their financial literacy.

Second: - Importance of study

This study is important because digital transformation is now one of the most widely discussed trends affecting many spheres. Also, the significance of the study is determined by the fact that financial literacy allows people to make the right financial choices. Moreover, the theme of the study becomes even more significant due to the application of the research findings to the academic and administrative employees of Al-Furat Al-Awsat Technical University.

Third: Study objectives:

1. To ascertain how much digital transformation has taken place at Al-Furat Al-Awsat Technical University.
2. To gauge a sample of the university's employees' financial literacy level.
3. To evaluate the effects of digital transformation on improving financial literacy.
4. To see how much digital transformation has helped improve employees' financial literacy and awareness.
5. To submit suggestions that can help the financial field take advantage of digital transformation.

Fourth: - Hypothetical Study model: -

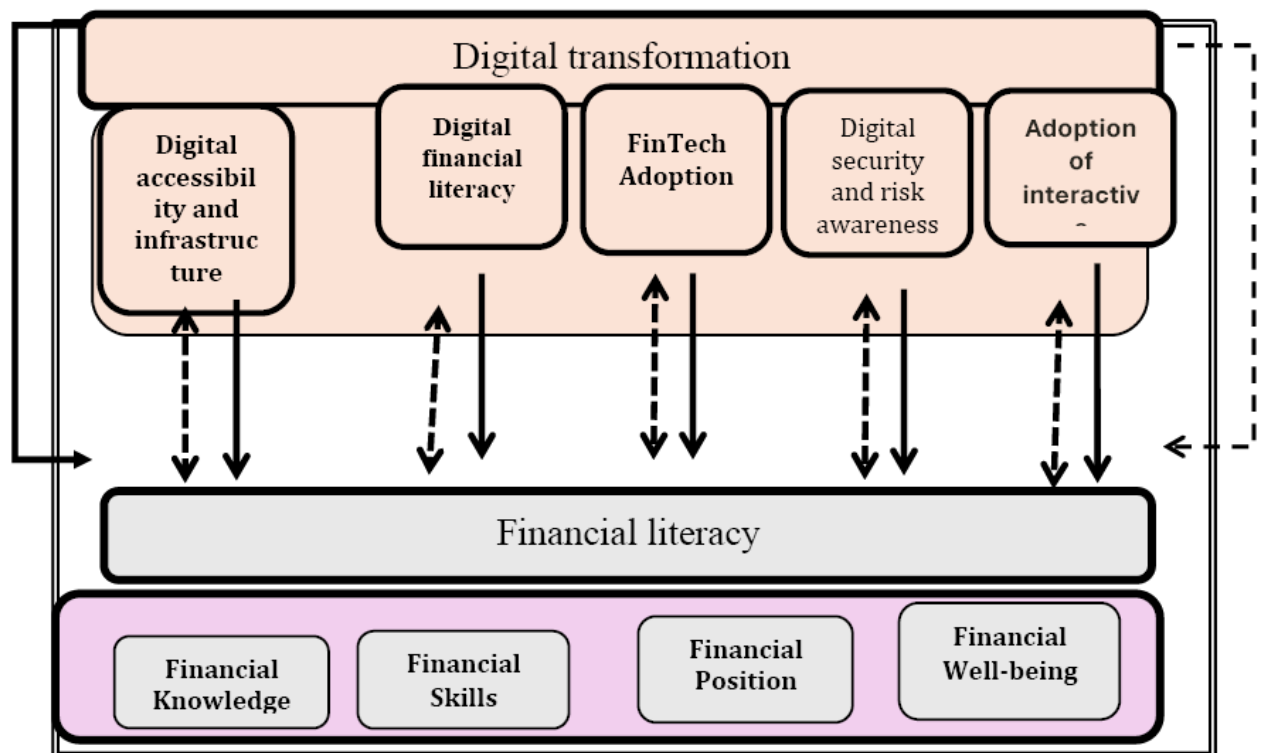


Figure 1. Hypothetical research model

Five: Hypothesis Study –

1. A significant statistical correlation exists between digital transformation and financial literacy of the employees of Al-Furat Al-Awsat Technical University.

Sub-Hypotheses of Relationship Hypothesis

- a) Digital accessibility and infrastructure have a statistically significant correlation with financial literacy in employees of Al-Furat Al-Awsat Technical University.
- b) Digital financial literacy seeking will statistically correlate with financial literacy of employees of Al-Furat Al-Awsat Technical University.
- c) Fintech adoption and financial literacy in employees of Al-Furat Al-Awsat Technical University will statistically correlate with each other.
- d) Digital security and risk awareness and financial literacy in employees of Al-Furat Al-Awsat Technical University will statistically correlate with each other.
- e) Interactive financial applications adoption and financial literacy of employees of Al-Furat Al-Awsat Technical University will statistically correlate with each other.

2- Digital transformation has a statistically significant impact on improving financial literacy among employees at Al-Furat Al-Awsat Technical University.

Sub-hypotheses relating to the Hypothesis of Effect

- a) The accessible digital infrastructure has a statistically significant impact on financial literacy among employees at Al-Furat Al-Awsat Technical University.
- b) The pursuit of digital financial literacy has a statistically significant effect on financial literacy among employees at Al-Furat Al-Awsat Technical University.
- c) The adoption of FinTech has a statistically significant impact on financial literacy among employees at Al-Furat Al-Awsat Technical University.
- d) The awareness of digital security and risks has a statistically significant effect on financial literacy among employees at Al-Furat Al-Awsat Technical University.
- e) The readiness to use interactive financial applications has a statistically significant effect on financial literacy among employees at Al-Furat Al-Awsat Technical University.

Six: There are the following:

1- Methodology of Research:

This research employs a questionnaire as a tool to gather data from selected employees working at Al-Furat Al-Awsat Technical University. The sample will be chosen to represent the population of study.

2- Tool for Survey:

This tool of survey is comprised of 45 items distributed into two main themes which represents different variables in study.

3- Analysis of Data:

The use of SPSS shall help in getting descriptive statistics which include mean, standard deviation, and a coefficient of variation. The tool will also be checked for reliability and validity, which will involve the use of Cronbach's alpha, Guttman, and Spearman correlations, while correlation tests will also be

conducted to study the connections between financial literacy and different dimensions of digital transformation.

The second section: Theoretical Framework

Axis One: Digital Transformation

First: Concept of Digital Transformation

The concept of digital transformation is regarded as one of the key notions of modern public administration and economics, as it means an integrated process of redesigning activities, services, and processes based on digital technologies to improve the efficiency of the organization and the value of its services (Vial, 2019). It should be noted that digital transformation should not be viewed as merely introducing technologies into the organization to perform supporting functions. Rather, it also implies a thorough transformation of the business model, decision-making processes, and the relationships of the organization with its environment (Bharadwaj et al., 2013). From this perspective, digital transformation can be viewed as a transition from traditional management based on manual processes to smart management based on data computation, swift communication, automation, and system integration (Hess et al., 2016).

More broadly, digital transformation is seen to indicate the capacity of organizations to use new technologies including cloud computing, artificial intelligence, the Internet of Things and big data analytics for improving their performance and competitiveness (Verhoef et al., 2021). Digital transformation is also perceived as a process of continuous transformation rather than just introduction of technologies, but rather a process of adjustment to the technological, behavioral, and organizational changes imposed by modern digital world (Warner & Wäger, 2019). Thus, digital transformation has become something more than just an additional means of development, but rather a strategic necessity for achieving success and survival in a rapidly changing and complex world.

Second: Importance of Digital Transformation

Digital transformation matters as a means of improving the efficiency of organizations' operations, quality of services, and reducing costs through automation of processes, faster flow of information, and less reliance on the old-fashioned paper procedures (Teece, 2018). It makes positive contributions to competitiveness by allowing institutions to deliver more adaptive, tailor-made, and customer-oriented services complying with their shifting needs (Nambisan et al., 2017). Thus, digital transformation promotes improvements in internal efficiency as well as opens new possibilities for innovations, expansion, and development.

In addition, the significance of digital transformation is seen in its ability to support data-driven decision-making as it allows organizations to gather and analyze large data volumes in real time, thus reducing risks and improving responsiveness to changes both in the environment and economy (Bharadwaj et al., 2013). Furthermore, digital transformation promotes digital and economic inclusion by providing access to education, healthcare, finance, and public administration services particularly in conditions of limited resources and weak traditional infrastructures (OECD, 2020). Hence, digital transformation is a crucial

basis for building smarter and more flexible organizations and economies ready for meeting the future challenges.

Third: Dimensions of Digital Transformation

1- Digital Accessibility and Infrastructure

Digital accessibility and infrastructure are the foundation of digital transformation that uses physical channels to link economies (World Bank, 2021). Telecommunications is essential for solving the "digital divide" and is defined as the capacity to acquire smart devices and utilize inexpensive high-speed internet (ITU, 2022). Investing in networks contributes to resilient economies (Pradhan et al., 2018) and improves banking as well as decreases transaction expenses and settlement duration (Roller & Waverman, 2001). Regulations enable fair geographical distribution of services (Dewan & Riggins, 2005), and infrastructure quality encompasses not only subscribers but also continuity of service (Gruber & Koutroumpis, 2011). It is necessary to develop strong digital infrastructure for the establishment of the integrated digital financial society (Compaine, 2001).

2- Digital Financial Literacy

Digital financial literacy is the extension of standard literacy to the context of cyberspace and encompasses the awareness of financial products (Morgan et al., 2019). It is defined as the knowledge, skills, attitudes, and behaviors necessary for safe digital finance use (Prasad et al., 2021) and prevents economic marginalization (Ghazali et al., 2022). It presupposes the comprehension of e-wallets, crowdfunding and lending algorithms (Panos & Wilson, 2020), knowledge of pricing and smart contracts, and automated credit interest in order to avoid falling into the trap of debt (Lyons & Kass-Hanna, 2021). In addition

3- FinTech Adoption

The use of FinTech implies a change in attitude toward the digital financial model based on innovations (Gomber et al. 2017) and can be illustrated with the real adoption of mobile payments, peer-to-peer lending, and robo-advisors (Chanias et al. 2019). Behavioral intention is the usage of advanced services that combine finance and technology together (Arner et al. 2015) under conditions of ease and effectiveness trips (Davis 1989) as a consequence of becoming trustworthy regarding the technology (Stewart & Jürjens 2018). Demographically speaking, it is more likely to obtain the adoption from youngsters (Milian et al. 2019) and the improvements of customer experience boost the adoption rate as well (Hu et al. 2019). The technology has lowered the costs and provided access to financing (Haddad & Hornuf 2019) while the experience in using the FinTech has resulted in higher levels of self-efficacy (Fu & Mishra 2022). Analyzing adoption motivations has been important for understanding the applicability of this technology (Alt et al., 2018).

4- Digital Security and Risk Awareness

In order to be able to use FinTech solutions successfully, companies must focus on digital security and risk awareness as this dictates the creation of a secure area with good information protection (Garcia, 2021). Digital security is responsible for protecting identity, personal

data, and property from hacking (Smith, 2021) while risk awareness is about getting aware of existing threats (Miller, 2019; Wilson, 2022). Security is done through encryption and multi-factor authentication (Johnson, 2022) and through training which helps fight phishing attacks (Jackson, 2018). Risk management should be already part of governance (Martin, 2020). The emergence of IoT solutions and supply chains makes attack surfaces wider (Robinson, 2020) while deepfake technologies from the other side make it difficult to be sure about identity (Rodriguez, 2022).

5- Interactive Financial Applications

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Axis Two: Financial Literacy

First: Concept of Financial Literacy

The idea of financial literacy has been recognized as one the most important concepts in economic and behavioral science research. Financial literacy means possessing information about finance, skills to handle this knowledge, attitudes towards money, and behavior in specific situations. It is not enough for individuals to know mathematics and some technical terms related to finance; they should also be able to adequately evaluate financial situations, understand different financial products, and handle their income, savings, and loans in an appropriate manner. Hence, financial literacy is treated like cognitive and behavioral theory that allows individuals to know how to manage their finances properly in today's economic environment.

In an academic environment, financial literacy is seen as both an instrument of individual empowerment and a means of social empowerment, due to its association between knowledge of finance, practical use of the skill, and behavioural awareness that allow people to refine their economic decisions in their everyday lives (Lusardi & Mitchell, 2014). Moreover, recent studies confirm that the term is not restricted to the traditional aspects of understanding money. Instead, it involves managing modern financial services, understanding risks connected to cashless transactions, and differentiating between the various options available on the financial market (Klapper et al., 2015).

Second: Importance of Financial Literacy

Financial literacy is of great importance, as it represents one of the major factors enhancing people's and families' economic decision-making ability and thus, increases their potential

in financial planning, saving, debt regulation, and making more rational choices about consumption priorities (Hilgert et al., 2003). Individuals with higher levels of financial literacy are likely to avoid such common financial mistakes, as overborrowing, poor retirement planning, or incorrect allocation of income between currently needing and future needs (Van Rooij et al., 2011). In this respect, financial literacy is an instrument for achieving personal financial stability and ensuring responsible economic behavior rather than merely theoretical knowledge.

The significance of the concept arises from its contribution to financial inclusion and economic well-being. The idea is that financial literacy is something that enables people to understand and use modern financial services, which in turn enhances their chances of being able to use banking and investment services (Xu & Zia, 2012). Financial literacy also leads to decreased level of financial stress. People who know about financial literacy are better prepared for overcoming economic challenges and making sound choices during the times of crisis (Lusardi & Mitchell, 2014). Thus, spreading financial literacy among people is a type of investment, which provides long-term benefits for the society.

Third: Dimensions of Financial Literacy

1- Financial Knowledge

The concept of financial knowledge is rooted in the foundations of financial culture. According to the OECD, the knowledge of basic financial concepts and risks, as well as the knowledge of the numeric skills used to make sound decisions, defines financial knowledge (OECD, 2023). Financial knowledge can be viewed as human capital that is a driving force behind economic abilities (Lusardi & Mitchell, 2014) consisting of knowing the concept of time value of money, inflation, and the principle of risk diversification (Remund, 2010). The lack of financial knowledge results in personal financial distress (Huston, 2010). The correlation with the ability to plan the retirement and manage debt is obvious (Fernandes et al., 2014) and is affected by demographic reasons (Volpe et al., 2006). Financial knowledge defines people's attitude towards money and their rational cautiousness (Chen & Volpe, 1998). The more people invest in financial literacy, the more stable people in society are (Xu & Zia, 2012). The period of digitalization requires the development of the concept of digital financial literacy that will include knowledge about security and cyber fraud (Klapper et al., 2015). Financial knowledge is a constant process of learning (Hilgert et al., 2003).

2- Financial Skills

Financial skills represent the procedural side of financial literacy transforming knowledge into daily decisions (Huston, 2010), which forces the creation of controlled budgets and unforced spending (Remund, 2010). Defined as making proper use of resources with numerical and analytical skills (OECD, 2020), they help consumers protect themselves from fraud and overborrowing (Campbell, 2006). Skills relate to long-term planning, saving, and investing for retirement (Lusardi & Mitchell, 2007), with their absence making it impossible to calculate compound interest (Fernandes et al., 2014). Skills include crisis management via emergency funds (Gjertson, 2016), and are evaluated based on real financial actions taken (Mundy, 2011). Digital skills are necessary for internet banking and smartphone applications

(Klapper et al., 2015), and also mean that the security of transactions should be evaluated (Xu & Zia, 2012). Practice has proved to be more effective than theory (Miller et al., 2015), and strong negotiation skills help to receive better conditions of borrowing (Nicolini et al., 2013). Skill gaps exist in different social groups (Volpe et al., 2006), which means that education on such topics should start long ago (Aprea et al., 2016). The assessment of skills needs to be done appropriately (Alba & Hutchinson, 2000).

3- Financial Position

The financial position is defined variously in literature as a psychological factor and the value system that implements economic choices (Nye & Hillyard, 2013). Financial position refers to the psychological stance towards spending, saving, and taking risks (Robb & Woodyard, 2011) that acts as a guide in the consumption of resources (Shim et al., 2010). Having a positive financial position helps to avoid making random decisions (Jorgensen & Savla, 2010) and relates to postponing immediate satisfaction for future purposes (Parrotta & Johnson, 1998). It is claimed that people's financial positions are influenced by one's upbringing and values acquired from their family (Webley & Nyhus, 2006). Understanding the emotional aspects of people's positions is important (Hayhoe et al., 2000). The concept of financial position links the idea of a financial locus of control, where individuals take personal responsibility, thus becoming disciplined (Perry & Morris, 2005). Improving psychological impulses can serve as a protective factor for an individual in case of a financial downturn (O'Neill et al., 2005). The development of IT can be used to assess an individual's financial position in regard to the usage of fintech (Gutter & Copur, 2011).

4- Financial Well-being

Financial wellness being the most extensive dimension consists of having security and capability to cover one's obligations with financial freedom (CFPB, 2015). It is argued to be defined as adoption of management of obligations, in terms of standing against pressures, planning, and achieving goals (Mokhtar et al., 2020), hence being seen as a result of accumulation of knowledge, skills, and position, intertwined with other factors (Brüggen et al., 2017). A high level of income by itself does not provide a person with well-being without proper planning (Gutman et al., 2015). Contrarily, effective management leads to higher sense of happiness (Dew & Xiao, 2011). Well-being is connected with mental and physical health (Sweet et al., 2013) whereby the feelings of incapacity lead to emotional decision-making (Turunen & Hiilamo, 2014) and is manifested through fulfilling requirements, emergency savings, keeping savings for retirement, managing debts, and ensuring safety in the future (Shim et al., 2009). Age, household, and education influence the mentioned aspects (Worthy et al., 2010). Moreover, financial wellness consists of resisting the pressures coming from outside and coping with economic difficulties (Fan & Chatterjee, 2019), achieved through financial reserves (Kaur et al., 2021).

The third section: Applied section of the study

This section consists of three sections:

First Segment: Descriptive Assessment of Independent Variables: This segment is a descriptive assessment of responses given by respondents belonging to the sample regarding independent variables of the questionnaire.

Descriptive Summary of Responses of the Sample Based on Mean and Standard Deviation with relative importance determined through Coefficient of Variation.

Results of the Responses from the Sample Related to Independent Variable "Digital Transformation"

Table 1. This indicates that the mean of the dimension of the estimates for Digital Transformation (n= 106)

The Dimension	Paragraph	Mean	Std. Deviation	coefficient of variation
Digital accessibility and infrastructure Seeking	X1	3.83	.841	0.220
	X2	4.02	.884	0.220
	X3	3.83	.851	0.222
	X4	3.91	.891	0.228
	X5	3.91	.868	0.222
Digital financial literacy	X6	3.92	.812	0.207
	X7	4.01	.941	0.235
	X9	3.92	.857	0.219
	X9	3.91	.847	0.217
	X10	4.05	.740	0.183
FinTech Adoption	X11	3.93	.708	0.180
	X12	3.93	.869	0.221
	X13	4.09	.851	0.208
	X14	3.91	.719	0.184
	X15	3.97	.837	0.211
Digital security and risk awareness	X16	3.90	.829	0.213
	X17	3.74	.872	0.233
	X18	3.96	.855	0.216
	X19	3.96	.785	0.198
	X20	4.04	.832	0.206
Adoption of interactive financial applications	X21	4.07	.879	0.216
	X22	4.01	.881	0.220
	X23	4.00	.776	0.194
	X24	4.07	.869	0.214
	X25	3.98	.805	0.202

Table 2. Ranking of importance according to the coefficient of variation for the Digital Transformation (n= 106)

The Dimension	Mean	Std. Deviation	coefficient of variation	Ranking
Digital accessibility and infrastructure Seeking	3.913	0.827	0.211	Third
Digital financial literacy	3.968	0.835	0.210	Second
FinTech Adoption	3.949	0.803	0.203	First
Digital security and risk awareness	3.932	0.861	0.219	Fifth
Adoption of interactive financial applications	4.019	0.865	0.215	Fourth
Digital Transformation	3.956	0.838	0.212	

According to the data presented in Table 1, the mean scores, standard deviations, and coefficients of variation for digital transformation dimensions and items have been noted. The results show that the mean score of Digital Transformation in general is high at 3.956, meaning that the respondents have a favorable view of the status of digital transformation at Al-Furat Al-Awsat Technical University. Among dimensions, Adoption of interactive financial applications has got the highest mean score of 4.019, with Digital financial literacy following closely after at 3.968. Meanwhile, Digital accessibility and infrastructure seeking recorded a mean score of 3.913. Regarding items, the means are generally close to each other and range from moderate to high values, meaning that the respondents agreed on the general importance of digital transformation dimensions.

Table 2 details the rankings of the dimensions of Digital Transformation based on the coefficient of variation. Fintech Adoption achieved the highest rank as reflected in its coefficient of variation of 0.203, while Digital financial literacy ranked second (0.210) and Digital accessibility and infrastructure seeking came third (0.211). The overall coefficient of variation for Digital Transformation is 0.212, which means that the respondents' opinions about the characteristics of digital transformations are not very different from one another.

Table 3. This indicates that the mean of the dimension of the estimates for Financial literacy variable (n= 106)

The Dimension	Paragraph	Mean	Std. Deviation	coefficient of variation
Financial Knowledge	Y1	4.08	.802	0.197
	Y2	3.94	.844	0.214
	Y3	4.03	.880	0.218
	Y4	3.90	.804	0.206
	Y5	3.97	.846	0.213
Financial Skills	Y6	3.95	.910	0.230
	Y7	3.98	.851	0.214
	Y8	3.87	.830	0.214
	Y9	3.90	.812	0.208
	Y10	3.92	.852	0.217
Financial Position	Y11	3.93	.826	0.210
	Y12	3.81	.831	0.218
	Y13	3.85	.945	0.245
	Y14	3.83	.846	0.221
	Y15	3.86	.837	0.217
Financial Well-being	Y16	3.90	.829	0.213
	Y17	3.72	.858	0.231
	Y18	4.13	.718	0.174
	Y19	4.33	.801	0.185
	Y20	4.32	.787	0.182

Prepared by the researcher according to the computer results

Table 4. Ranking of importance according to the coefficient of variation for Financial literacy variable (n= 106)

The Dimension	Mean	Std. Deviation	coefficient of variation	Ranking
Financial Knowledge	3.975	0.856	0.215	Second
Financial Skills	3.915	0.925	0.236	Third
Financial Position	3.843	0.969	0.252	Fourth
Financial Well-being	4.062	0.514	0.126	First
Financial literacy	3.949	0.816	0.207	

Table 4 illustrates the Financial literacy dimensions ranking in terms of their coefficient of variation. It conveys that Financial Well-being attained the highest rank and lowest coefficient of variation (0.126) and highest mean (4.062), which illustrates a good level of consensus among all of the interviewees with respect to this dimension.

On the second rank comes Financial Knowledge (0.215), followed by Financial Skills (0.236) and Financial Position (0.252), which resulted in the worst result in this regard.

The ranking shows that the respondents are serious about Financial Well-being, as compared to the other aspects of Financial literacy. The higher coefficient of Financial Position may indicate greater variance in opinions.

The second: Verification and reliability tests

1:-The relation of each paragraph with its criteria is calculated and presented in Table (5).

Table 5. The degree of correlation of each paragraph of the dimensions of (Digital Transformation) and the total score of the dimension (n= 106)

Dimensions of Digital Transformation	Paragraph	Correlation coefficient
Digital accessibility and infrastructure Seeking	X1	0.862**
	X2	0.858**
	X3	0.861**
	X4	0.874**
	X5	0.820**
Digital financial literacy	X6	0.837**
	X7	0.849**
	X8	0.840**
	X9	0.857**
	X10	0.847**
FinTech Adoption	X11	0.811**
	X12	0.796**
	X13	0.779**
	X14	0.848**
	X15	0.861**
Digital security and risk awareness	X16	0.832**
	X17	0.798**
	X18	0.843**
	X19	0.756**
	X20	0.776**
Adoption of interactive financial applications	X21	0.736**
	X22	0.863**
	X23	0.860**
	X24	0.867**
	X25	0.890**

Prepared by the researcher according to the computer results

Table 6. The degree of correlation of each paragraph of the variable (Financial literacy) and the total score of the variable (n= 106)

Dimensions of Financial literacy	Paragraph	Correlation coefficient
Financial Knowledge	Y1	0.855**
	Y2	0.821**
	Y3	0.911**
	Y4	0.855**
	Y5	0.869**
Financial Skills	Y6	0.788**
	Y7	0.837**
	Y8	0.883**
	Y9	0.824**
	Y10	0.857**
Financial Position	Y11	0.894**
	Y12	0.882**
	Y13	0.92**
	Y14	0.883**
	Y15	0.892**
Financial Well-being	Y16	0.596**
	Y17	0.664**
	Y18	0.478**
	Y19	0.472**
	Y20	0.586**

Prepared by the researcher according to the computer results

As presented in Tables (5) and (6), the correlation coefficients were derived by calculating correlations between each item and its dimension at Digital Transformation and Financial Literacy. The findings indicate that the entire correlation coefficients were high and statistically significant at the level of the 0.01, which shows the high level of internal consistency and proves that questionnaire items are valid for measurement of their dimensions. It supports the validity of the construct and illustrates that each item is sufficient in terms of consistency. Thus, it can be said that the questionnaire can be useful in finding out relationship between digital transformation and financial literacy.

2- **Cronbach's alpha:-** is an important statistical measure that helps us understand how consistent the items of a questionnaire or test are, meaning if they are measuring the same thing in the similar manner. Higher the value, more consistent the questionnaire is thus more reliable.

Table 7. Cronbach's alpha values for the questionnaire dimensions and the total score of the questionnaire (n= 106)

Dimensions	Paragraphs	Cronbach's alpha reliability coefficient
Digital accessibility and infrastructure Seeking	5	0.946
Digital financial literacy	5	0.938
FinTech Adoption	5	0.920
Digital security and risk awareness	5	0.915
Adoption of interactive financial applications	5	0.950
Dimensions of Digital Transformation	25	0.978
Financial Knowledge	5	0.946
Financial Skills	5	0.940
Financial Position	5	0.961
Financial Well-being	5	0.961
Dimensions of Financial literacy	20	0.967
The questionnaire is complete	45	0.985

Following the information provided in table 7, a Cronbach alpha coefficient of scores across the questionnaire shows a very high range of scores from 0.915 to 0.985, thus showing the high reliability and consistency of the instrument. The total score for the questionnaire is found to be 0.985, which indicates its reliability.

3:- The stability through the split-half method. Use of the Spearman-Brown formula in the split-half analysis allows estimating the degree of homogeneity of the samples, which means that reliability coefficient for one half enables the prediction of reliability coefficients for the other half for all the methods specified in Table 8.

Table 8. represents the correlation values for the questionnaire components
(n= 106)

Dimensions	Paragraphs	Spearman's coefficient	Gutman's coefficient
Digital accessibility and infrastructure Seeking	5	0.949	0.949
Digital financial literacy	5	0.954	0.953
FinTech Adoption	5	0.891	0.887
Digital security and risk awareness	5	0.885	0.884
Adoption of interactive financial applications	5	0.944	0.943
Dimensions of Digital Transformation	25	0.946	0.954
Financial Knowledge	5	0.930	0.929
Financial Skills	5	0.943	0.941
Financial Position	5	0.956	0.956
Financial Well-being	5	0.450	0.445
Dimensions of Financial literacy	20	0.947	0.920
The questionnaire is complete	45	0.945	0.941

As shown in Table (8), most dimensions of the questionnaire have a high degree of reliability and internal consistency, as evidenced by the relatively robust Spearman and Guttman coefficients. High values of 0.945 and 0.941 were achieved for the questionnaire as a whole, confirming that this instrument is reliable and can be used to gather and analyze data for this study.

the third: Testing the research hypotheses

1- Correlations between Study variables

Table (9) Correlation matrix between the dimensions of Digital Transformation and Financial literacy (n= 106)

Relationship	Correlation Coefficient	Significance Level
Digital accessibility and infrastructure Seeking	0.671	0.000
Digital financial literacy	0.688	0.000
FinTech Adoption	0..635	0.000
Digital security and risk awareness	0.645	0.000
Adoption of interactive financial applications	0.645	0.000
Dimensions of Digital Transformation	0.726	0.000

Table 9: Correlation Results between Dimensions of Digital Transformation and Financial Literacy

Indicators Dimensions	value(F)	(R2)	(β)	(Sig)
Digital accessibility and infrastructure Seeking	85.041	0.450	0.671	0.000
Digital financial literacy	139.772	0.573	0.757	0.000
FinTech Adoption	121.082	0.538	0.733	0.000
Digital security and risk awareness	239.735	0.697	0.835	0.000
Adoption of interactive financial applications	232.589	0.691	0.831	0.000
Dimensions of Digital Transformation	282.380	0.731	0.855	0.000

The findings presented in Table 9 indicate that there exists a strong and statistically meaningful correlation between all aspects of digital revolution and financial literacy of the personnel of Al-Furat Al-Awsat Technical University. The values of correlation coefficient appear to range from 0.635 (FinTech Adoption) to 0.688 (Digital Financial Literacy). The total correlation coefficient of the dimensions of digital transformation equals 0.726. The levels of significance are significant from statistical perspective; they vary from 0.000 to 0.001, meaning that these correlations cannot be unintentional. Overall, these data confirm the scope of the main hypothesis of the research, which produces evidence on the presence of significant relationship between the processes of digital transformation and the level of financial literacy.

2- Influence relationships between research variables

Table 10. Statistical values for the effect of Digital Transformation and Financial literacy (n=106)

Indicators Dimensions	value(F)	(R2)	(β)	(Sig)
Digital accessibility and infrastructure Seeking	85.041	0.450	0.671	0.000
Digital financial literacy	139.772	0.573	0.757	0.000
FinTech Adoption	121.082	0.538	0.733	0.000
Digital security and risk awareness	239.735	0.697	0.835	0.000
Adoption of interactive financial applications	232.589	0.691	0.831	0.000
Dimensions of Digital Transformation	282.380	0.731	0.855	0.000

The findings presented in Table (10) prove that digital transformation positively and statistically significantly impacts the financial literacy of employees of Al-Furat Al-Awsat Technology University, confirming the main hypothesis of the study. Moreover, F-values are sufficiently high, and the level of significance is also statistically important ($\text{Sig}=0.000<0.05$), meaning that the mentioned dimensions of digital transformation indeed positively and significantly impact financial literacy.

Among the dimensions of digital transformation, digital security and risk awareness appeared to be the strongest dimension with the highest β value, equal 0.835 and with coefficient of determination ($R^2=0.697$), while the adoption of interactive financial applications can be considered the second strongest dimension ($\beta=0.831$ and $R^2=0.691$). Finally, all dimensions of digital transformation show the highest total effect ($\beta=0.855$ and $R^2=0.731$). The results confirm the validity of sub-hypotheses for digital transformation dimensions and show the importance of developing digital skills and awareness for financial literacy improvement among employees of educational institutions.

Section Four: Conclusions and recommendations

First: Conclusions

11. The extent of digital transformation at Al-Furat Al-Awsat Technical University is relatively high with the average of 3.956. The most important factors of digital transformation are ranked as follows: "Adoption of Interactive Financial Applications" takes the first place with the mean of 4.019; whereas "Digital Accessibility and Infrastructure" has the lowest level of mean of 3.913, which indicates that there is a need to invest more in the infrastructure.
2. Among the components of financial literacy, "Financial Well-being" comes first with the average of 4.062 and low variability. The component "Financial Position" has the highest variability, but the lowest average of 3.843 which shows that there are different psychological attitudes on financial issues among the employees of the institution.
3. According to the findings of the validity and reliability testing, the internal consistency is high as indicated by the Cronbach's alpha coefficients ranging from 0.915 to 0.985, which indicates that the instrument is reliable and applicable for collecting data.
4. The study showed that there is a strong positive correlation between all dimensions of digital transformation and financial literacy with the overall correlation being 0.726. The strongest correlation was identified with respect to "Digital Financial Literacy" being 0.688; and the lowest one was identified with respect to "FinTech
- 5 -The results show that digital transformation has both positive and significant effects on one's financial literacy ($\beta = 0.855$, $R^2 = 0.731$), while the dimension with the biggest influence on the effects is actually "Digital Security and Risk Awareness" ($\beta = 0.835$), followed by "Adoption of Interactive Financial Applications" ($\beta = 0.831$).
- 6- The difference in people's answers regarding "Digital Security and Risk Awareness" and "Financial Position" emphasizes the need for targeted measures in order to eliminate the gaps regarding the awareness of cybersecurity and psychological attitude towards money matters.

7- It should be noted that this research offers empirical findings that support the idea that digital transformation is one of the key factors that improve financial literacy comprehension among employees from public universities in Iraq and thus fills the gap in the literature.

Second: Recommendations

1- Make improvements in digital system by means of increasing investment in fast connectivity, good networks, and new equipment. Increase number of digital points of access in all campuses and create a special support team to help staff in digital solutions.

2- Launch intricate programs for digital finance education that will involve lessons on the use of the internet in finance, digital payments, and e-wallets. Create easy-to-understand educational materials and run workshops with professionals from banks and IT companies.

3- Promote the usage of FinTech solutions by formulating easy-to-follow guides, showing its advantages, and providing some perks for its usage. Work together with FinTech companies and banks and create an interactive feedback system while running campaigns about mobile banking and digital investments.

4- Formulate the program of cyber security knowledge oriented toward safe password establishment, phishing detection, and safe internet usage. Organize trainings and role-play exercises, formulate and run official cyber security policies, and improve software products.

6. Promote interactive financial applications for financial transactions, budget tracking, and personal financial management. Ensure user-friendly and accessible interfaces, provide hands-on training and continuous support, and regularly update applications based on user feedback.

6. Build a financial education plan with precise objectives, methods, and performance measures. Carry out regular projects on budgeting and saving, debt regulation, retirement planning and providing financial consulting to get individual advice.

7. For the future studies do longitudinal research, follow the long-term results, include several Iraqi universities in the study, analyze the influence of some demographic factors, explore the influence of the organizational culture on leadership, analyze how AI and other modern technologies influence financial behavior, and do qualitative studies for better understanding of employees' attitudes.

References

1. Alba, J. W., & Hutchinson, J. W. (2000). Knowledge calibration: What consumers know and what they think they know. *Journal of Consumer Research*, 27(2), 123–156.
2. Alt, R., Beck, R., & Smits, M. T. (2018). FinTech and the transformation of the financial industry. *Electronic Markets*, 28(3), 235–243.
3. Aprea, C., Wuttke, E., Breuer, K., Kohne, N. K., & Linsner, I. (2016). *Financial literacy in the 21st century: An agenda for economic and citizenship education*. Springer.
4. Archuleta, K. L., Dale, A., & Spann, S. M. (2013). College students and financial distress: Exploring debt, financial satisfaction, and financial anxiety. *Journal of Financial Counseling and Planning*, 24(2), 50–62.
5. Arner, D. W., Barberis, J., & Buckley, R. P. (2015). The evolution of FinTech: A new post-crisis paradigm? *Georgetown Journal of International Law*, 47(4), 1271–1319.

6. Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital business strategy: Toward a next generation of insights. *MIS Quarterly*, 37(2), 471–482.
7. Braunstein, S., & Welch, C. (2002). Financial literacy: An overview of practice, research, and policy. *Federal Reserve Bulletin*, 88(11), 445–457.
8. Brüggén, E. C., Hogreve, J., Holmlund, M., Kabadayi, S., & Löfgren, M. (2017). Financial well-being: A conceptualization and research agenda. *Journal of Business Research*, 79, 228–237.
9. Brynjolfsson, E., & McElheran, K. (2016). Data in action: Data-driven decision making in organizations. NBER Working Paper.
10. Campbell, J. Y. (2006). Household finance. *The Journal of Finance*, 61(4), 1553–1604.
11. CFPB. (2015). Financial well-being: The goal of financial education. Consumer Financial Protection Bureau.
12. Chanas, S., Myers, M. D., & Hess, T. (2019). Digital transformation strategy making in pre-digital organizations: The case of a financial services provider. *The Journal of Strategic Information Systems*, 28(1), 17–33.
13. Chen, H., & Volpe, R. P. (1998). An analysis of personal financial literacy among college students. *Financial Services Review*, 7(2), 107–128.
14. Chinn, M. D., & Fairlie, R. W. (2007). The determinants of the global digital divide: A cross-country analysis of computer and internet penetration. *Oxford Economic Papers*, 59(1), 16–44.
15. Compaine, B. M. (2001). The digital divide: Facing a crisis or creating a myth?. MIT Press.
16. Dabholkar, P. A. (1996). Consumer evaluations of new technology-based self-service options: An investigation of alternative models of service quality. *International Journal of Research in Marketing*, 13(1), 29–51.
17. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
18. Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). The global Findex database 2017: Measuring financial inclusion and the fintech revolution. World Bank.
19. Dew, J., & Xiao, J. J. (2011). The financial management behavior scale: Development and validation. *Journal of Financial Counseling and Planning*, 22(1), 43–59.
20. Dewan, S., & Riggins, F. J. (2005). The digital divide: Current and future research directions. *Journal of the Association for Information Systems*, 6(12), 298–337.
21. Fernandes, D., Lynch, J. G., & Netemeyer, R. G. (2014). Financial literacy, financial education, and downstream financial behaviors. *Management Science*, 60(8), 1861–1883.
22. Fu, J., & Mishra, M. (2022). FinTech adoption and household resilience to shocks: Evidence from a national survey. *Journal of Financial Economics*, 144(1), 101–118.
23. Garcia, L. (2021). Internet of Things (IoT) security and expanded attack surfaces. *IEEE Security & Privacy Journal*, 9(6).
24. Ghazali, N. M., Ibrahim, S., & Yahya, M. H. (2022). Assessing the level of digital financial literacy: Empirical evidence from emerging economies. *Journal of Financial*

- Services Marketing, 27(3), 112–126.
25. Gjertson, L. (2016). Emergency saving and financial resilience. *Journal of Family and Economic Issues*, 37(1), 34–47.
 26. Gomber, P., Koch, J. A., & Siering, M. (2017). Digital finance and FinTech: Current research and future research directions. *Journal of Business Economics*, 87(5), 537–580.
 27. Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of Management Information Systems*, 35(1), 220–265.
 28. Goyal, K., & Kumar, S. (2021). Financial literacy: A systematic review and bibliometric analysis. *International Journal of Consumer Studies*, 45(1), 80–105.
 29. Goyal, K., & Kumar, S. (2022). Digital financial literacy: A bibliometric analysis and systematic literature review. *International Journal of Consumer Studies*, 46(1), 22–45.
 30. Grable, J. E., Park, J. Y., & Joo, S. H. (2009). Explaining financial management behavior for Koreans: The role of financial knowledge and risk tolerance. *Journal of Consumer Studies*, 33(1), 38–49.
 31. Gruber, H., & Koutroumpis, P. (2011). Mobile telecommunications and the impact on economic development. *Economic Policy*, 26(67), 387–422.
 32. Haddad, C., & Hornuf, L. (2019). The emergence of the FinTech market: Economic and technological determinants. *Small Business Economics*, 53(1), 29–45.
 33. Hess, T., Matt, C., Benlian, A., & Wiesböck, F. (2016). Options for formulating a digital transformation strategy. *MIS Quarterly Executive*, 15(2), 123–139.
 34. Hilgert, M. A., Hogarth, J. M., & Beverly, S. G. (2003). Household financial management: The connection between knowledge and behavior. *Federal Reserve Bulletin*, 89(7), 309–322.
 35. Huston, S. J. (2010). Measuring financial literacy. *Journal of Consumer Affairs*, 44(2), 296–316.
 36. ITU. (2022). Facts and figures: Global connectivity report. International Telecommunication Union.
 37. Jackson, T. (2018). Simulated cyber attacks as a training tool. *Journal of Computer-Assisted Learning*, 34(5).
 38. Johnson, K. (2022). Advanced cryptography and multi-factor authentication architecture. *Journal of Cloud Computing Security*, 22(1).
 39. Jorgensen, B. L., & Savla, J. (2010). Financial literacy of young adults: The importance of parental socialization. *Family Relations*, 59(4), 465–478.
 40. Karakurum-Ozdemir, K., Kokkizil, M., & Uysal, G. (2022). Measuring digital financial literacy: Development and validation of a new scale. *International Journal of Bank Marketing*, 40(1), 1–22.
 41. Smit, M., van Oort, S., & Koster, F. (2021). Financial literacy and financial inclusion: Empowering communities through financial services. *Journal of Financial Counseling and Education*, 12(3), 45–62.
 42. Tavares, F. O., & Almeida, L. (2025). Reframing financial literacy for the twenty-first century: Foundations, digital transformations, and pathways to sustainable empowerment. *Journal of Risk and Financial Management*, 18(11), 656. <https://doi.org/10.3390/jrfm18110656>