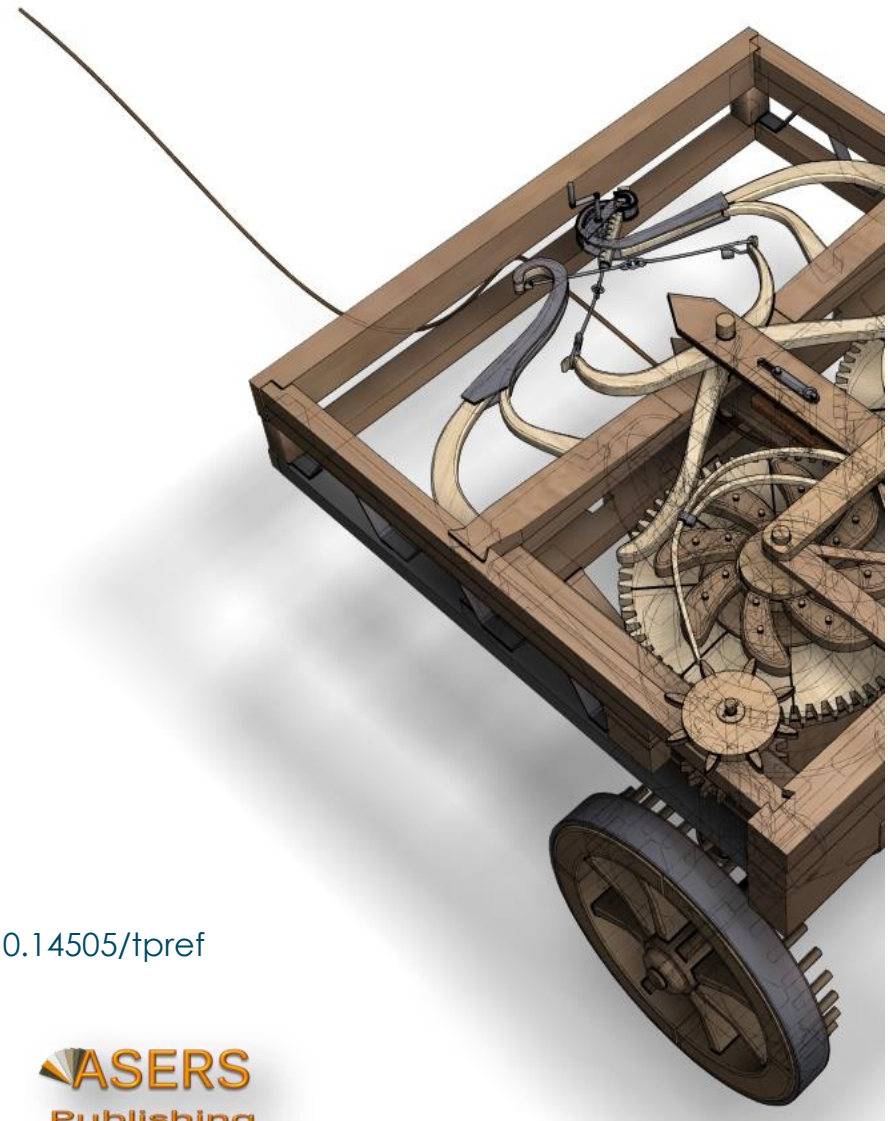
Theoretical and Practical Research in Economic Fields



Quarterly
Volume XV
Issue 4(32)
Winter 2024

ISSN: 2068 – 7710
Journal DOI: https://doi.org/10.14505/tpref

ASERS
Publishing

Volume XV
Issue 4(32)
Fall 2024

ASERS Publishing
ISSN 2068 – 7710
Journal's Issue DOI:
https://doi.org/10.14505/tpref.v15.3(31).00

Table of Contents

Volume XV
Issue 3(31)
Fall 2024

ASERS Publishing
http://www.asers.eu/asers-publishing
ISSN 2068 – 7710
Journal's Issue DOI:
https://doi.org/10.14505/tpref.v15.3(31).00

Call for Papers
Spring Issue
Theoretical and Practical Research in Economic Fields

Many economists today are concerned by the proliferation of journals and the concomitant labyrinth of research to be conquered in order to reach the specific information they require. To combat this tendency, **Theoretical and Practical Research in Economic Fields** has been conceived and designed outside the realm of the traditional economics journal. It consists of concise communications that provide a means of rapid and efficient dissemination of new results, models, and methods in all fields of economic research.

Theoretical and Practical Research in Economic Fields publishes original articles in all branches of economics – theoretical and practical, abstract, and applied, providing wide-ranging coverage across the subject area.

Journal promotes research that aim at the unification of the theoretical-quantitative and the empirical-quantitative approach to economic problems and that are penetrated by constructive and rigorous thinking. It explores a unique range of topics from the frontier of theoretical developments in many new and important areas, to research on current and applied economic problems, to methodologically innovative, theoretical, and applied studies in economics. The interaction between practical work and economic policy is an important feature of the journal.

Theoretical and Practical Research in Economic Fields is indexed in SCOPUS, RePEC, ProQuest, Cabell Directories and CEEOL databases.

The primary aim of the Journal has been and remains the provision of a forum for the dissemination of a variety of international issues, practical research, and other matters of interest to researchers and practitioners in a diversity of subject areas linked to the broad theme of economic sciences.

At the same time, the journal encourages the interdisciplinary approach within the economic sciences, this being a challenge for all researchers.

The advisory board of the journal includes distinguished scholars who have fruitfully straddled disciplinary boundaries in their academic research.

All the papers will be first considered by the Editors for general relevance, originality, and significance. If accepted for review, papers will then be subject to double blind peer review.

Deadline for submission of proposals:	10th February 2024
Expected publication date:	30th March 2024
Website:	http://journals.aserspublishing.eu/tpref
E-mail:	tpref@aserspublishing.eu

To prepare your paper for submission, please see full author guidelines in the following file: https://journals.aserspublishing.eu/tpref/Template_for_Authors_TPREF.docx on our site.

Volume XV, Issue 4(32), Winter 2024

DOI: https://doi.org/10.14505/tpref.v15.4(32).11

Digital Financial Education for Economic and Financial Inclusion in Vulnerable Sectors of Peru

Neptalí Rojas ORTIZ
César Vallejo University, Peru
rrojasor5@ucvvirtual.edu.pe
ORCID: 0000-0002-4592-1773

Joél Vásquez TORRES
César Vallejo University, Peru
vvasqueztor@ucvvirtual.edu.pe
ORCID: 0000-0002-1135-5312

Víctor Hugo Puican RODRÍGUEZ
César Vallejo University, Peru
vpuican@ucvvirtual.edu.pe
ORCID: 0000-0001-7402-9576

Article info: Received 25 October 2024; Received in revised form 11 November 2024; Accepted 6 December 2024; Published 30 December 2024.

Abstract: The study explores the influence of digital financial education on the financial inclusion of workers in the construction sector in Peru. A quantitative approach with a non-experimental and cross-sectional design was used, applying a questionnaire to 128 self-employed workers. The results indicate a moderate influence of digital financial education on financial inclusion, with an R value of 0.541 and an R^2 of 0.292. The ANOVA analysis and the regression coefficients confirm the significance of the model ($p < 0.001$). Factors such as perception and trust in digital banking and integration of emerging technologies significantly influence financial inclusion. Most workers have a good level of digital financial literacy, although there is a need to improve training in digital tools; revealing that digital financial literacy is crucial for financial inclusion and sustainable economic growth, fulfilling Sustainable Development Goal 8.

Keywords: digital literacy; social inclusion; emerging technologies; savings and planning; digital services; sustainable economy.

JEL Classification: B26; G53; G50.

Introduction

Digital financial education (DFE) is key to financial inclusion (FI), especially in vulnerable sectors such as construction, so research on this topic is crucial.

This work contributes directly to Sustainable Development Goal 8, as the DFE is a key component in achieving this goal, as it empowers workers to manage their finances effectively, encourage savings and plan for the future.

Globally, the DFE faces significant challenges, such as limited and costly internet access, lack of adequate mobile applications and insufficient supply of digital financial services (DFS), showing that people lack money management skills, which prevents them from taking advantage of these tools (Zaimovic *et al.* 2024). Likewise, the complexity and lack of support on digital platforms decrease their use and satisfaction, creating gaps in FI, given that the scarce training on artificial intelligence and new technologies limits their application in personal financial management (Benedetta *et al.* 2024). In the same vein, Wan and Abdul (2023) state that training in digital tools is essential, but the lack of adequate training and accessible workshops hinders their adoption, added to this, distrust in digital banking, concerns about data protection and the quality of customer service also affect negatively.

In Peru, the DFE faces important challenges that directly affect workers, such as the supply of mobile financial applications that are not aligned with the needs of these workers, as well as distrust in financial institutions that limit their use (Olano *et al.* 2024). Despite the innumerable challenges related to the context of the informality of the Peruvian economy and the low-income trap in some sectors (Paredes-Valverde *et al.* 2024), including financial rationality and education on how to manage personal finances can improve the scenario even if incrementally but in the long term. It is in this sense that FI becomes relevant in structurally changing the individual condition of citizens.

At the same time, Náñez *et al.* (2024) stated that the lack of digital skills restricts the effective use of emerging technologies, because workers continue to face challenges in financial management due to the lack of tools and knowledge. In contrast, Juliao *et al.* (2022) pointed out that the slow adoption of new technologies has a negative impact on FI; likewise, poor digital financial literacy translates into poor personal financial management.

In Peru, construction workers' FI is exacerbated by limited connectivity and lack of adequate mobile apps; local DFSs are not adapted to their needs, and the lack of DFE programs prevents efficient money management; low digital literacy limits the use of emerging technologies (ET) and AI in financial management; furthermore, the lack of digital financial literacy leads to poor management of personal finances, perpetuating financial exclusion; similarly, workers do not effectively use digital platforms for bill payment or balance management, affecting their financial stability and ability to save.

The DFE is based on human capital theory, as it is relevant in the context of Peruvian construction workers, who, by acquiring digital financial skills, can better manage their resources, reduce economic vulnerability; likewise, sustainable development theory also supports the scarcity of integrating the DFE, as it promotes inclusive and sustainable economic growth.

In practice, the implementation of DFE programs has a direct and tangible impact on the lives of Peru's blue-collar workers by improving their ability to access and use financial services, enabling them to better manage their income, save for the future and prepare for financial emergencies.

The methodological rationale for this study lies in its ability to provide accurate and actionable data to understand and improve the FI of Peru's workers; the combination of the methodology considered will ensure a comprehensive and informed assessment of the current situation and the interventions needed for more inclusive economic progress.

The general objective was to explore the influence of digital financial education on the financial inclusion of construction sector workers in Peru; the hypothesis considered is that there is a direct and significant influence of DFE on the FI of construction sector workers in Peru.

1. Literature Review and Research Background

Tabassum and Ali (2024) showed that the digitization of DFS has significantly improved FI among construction workers; a positive correlation was identified between the use of digital financial platforms, such as digital wallets and mobile banking, and increased levels of DFE; they managed to conclude that DFE is crucial for increasing FI and improving financial literacy among construction workers. Fauziyah *et al.* (2024) study revealed that digital financial literacy was positively correlated with increased knowledge, rational attitudes and responsible financial behavior; concluding that digital FI played a vital role in bridging gaps and ensuring the path to sustainable development.

Falaiye *et al.* (2024) revealed that DFE significantly increased the use of DFS among construction workers, reducing financial exclusion by 40%; concluding that digital literacy is crucial to maximize the benefits of FI through technology, as the rise of mobile banking has changed the rules of the game, allowing people with limited access to traditional banking infrastructure to conduct financial transactions seamlessly. Widyastuti *et al.* (2024) found that digital financial literacy and demographic factors influence digital FI. While gender and marital status showed an insignificant effect, age, income and occupation significantly explained FI. The model used was able to correctly predict 84.4% of respondents in terms of digital financial inclusion or not; they concluded that digital financial literacy is crucial to maximize the benefits of FI through technology.

Vasile *et al.* (2021) showed that digital financial literacy correlates positively with increased knowledge, rational attitudes and responsible financial behavior; furthermore, FI played a vital role in closing gaps and ensuring sustainable development; they concluded that literacy and FI are essential to improve financial capabilities, promote sustainable financial security and support the Sustainable Development Goals. Ramirez-Asis *et al.* (2024) indicated that there are positive and negative relationships between FI and socioeconomic variables, such as formal employment, educational level, and area of residence; they concluded that improving formal employment, educational level, and considering area of residence are effective strategies to promote FI.

Gaspar-Barrios *et al.* (2024) found that financial literacy is related to a series of factors, such as type of university degree, level of indebtedness, technological gap, ICT use, materialism and gender inequality; concluding that the development of financial literacy is fundamental in the education of higher education students, as it allows them to relate theory to practice. Herrera *et al.* (2023) found a high positive correlation (0.858) between the variables; concluding that digital payments and all its dimensions favor FI. Condori *et al.* (2023) showed that 78% of accountants reported having knowledge of financial culture, but 34% indicated that this knowledge did not come from university classrooms and 88% have difficulties in assimilating financial terms; concluding that the lack of adequate DFE at the basic and university levels negatively affects financial decision making when they are already professionals. Evidently, financial literacy and culture has an impact at the level of consumers, firms, and the economy as a whole (Díaz Tantalean *et al.* 2022).

Salas *et al.* (2022) revealed that the advantages of digitalization, innovation, open banking trends and a cooperative model. However, fintechs also face obstacles, such as lack of suitable financial products and high operating costs compared to low profit margins. They concluded that fintechs. Cotrina and Pumarrumi (2020) showed that the digital wallet is used as an FI strategy in MSEs, improving service performance and favoring both business and FI; concluding that the digital wallet is effective as an FI tool in MSEs.

DFE is shaped by Becker and Mincer's human capital theory, they highlighted education and training as essential investments to improve skills and opportunities; in the field of DFE, this theory emphasizes the importance of basic technological skills, such as digital literacy, to access and effectively use online platforms (Leoni, 2023).

Likewise, this theory contributes to training in digital financial tools by increasing efficiency in the use of applications and software (Beller *et al.* 2024). Workshops and online courses teach workers to handle financial management applications, budgets and digital investment tools, thus improving their technical competence; at the same time, perception and confidence in digital banking also benefit from human capital theory, by fostering cognitive and decision-making capabilities (Chriswick, 2024).

Theory is fundamental for the integration of emerging technologies in the DFE, given that it is based on the constant updating of skills and knowledge, in addition, courses on blockchain, artificial intelligence in finance and fintech prepare workers to adopt and effectively take advantage of these innovations (Obinna, 2024).

DFE is the one that establishes when a person possesses the knowledge and skills to use digital devices and make better financial decisions (Golden & Cordie, 2022).

Access to and use of digital platforms is the ability of individuals to use online tools and services through digital devices, facilitating various activities such as communication, education, and financial transactions (Ha *et al.* 2023; Madanaguli *et al.* 2023). It is also defined as the ability to use and navigate online applications and services to perform everyday activities, demonstrating that digital literacy is important to maximize the benefits of these platforms (Mohammed & Salim, 2023).

Digital financial tools training is that which focuses on preparing people to use advanced financial technologies, such as online banking and financial management applications, through education and specific training in the use of these technologies (Dyukina *et al.* 2020). This training includes the development of skills in financial application management, digital security and the effective use of financial analysis tools, thus promoting FI and economic efficiency (Chen, 2022).

Perception and trust in digital banking is when users perceive the security, privacy and efficiency of online banking services, which influences their willingness to use these services. Factors such as perceived risk, perceived ease of use and perceived usefulness are crucial in this context (Kaur & Arora, 2020). Trust in digital banking is built through positive experiences with banking technology and the perceived security provided by financial institutions, which is critical for the adoption of these services (Basory *et al.* 2023).

The integration of emerging technologies is the adoption of advanced tools such as blockchain, artificial intelligence and robotic automation to improve processes and services, providing new opportunities and challenges for institutions and users (Smith, 2020). This integration seeks to improve the efficiency and effectiveness of DFS and educational, facilitating accessibility and personalization through the use of cutting-edge technologies (Tondeur *et al.* 2021).

FI is shaped by the theory of sustainable development, popularized by the Brundtland Commission in 1987, has significantly influenced access to financial services, highlighting the need to ensure benefits for both present and future generations, while emphasizing the importance of providing equitable access to essential DFS, regardless of geographic location or socioeconomic status (Suhrab *et al.* 2024). Likewise, the use of DFS benefits from this theory, promoting technologies that improve efficiency and accessibility, reducing barriers and increasing FI (Dash & Mohanta, 2024).

Also, it contributes to economic stability as it is enhanced by FI, which enables a more equitable distribution of resources, reduces poverty and promotes inclusive growth; finally, FI policies and regulations can be integrated with the principles of sustainable development, as it advocates regulatory frameworks that support equitable access to financial services, protect consumers and promote economic stability by encouraging innovation and the adoption of sustainable financial practices (Amaliah *et al.* 2024).

FI is defined as the ability of people and businesses to access useful and affordable DFS that meet their needs in a responsible and sustainable manner. (Sapre, 2022).

Access to basic DFS which implies the availability and use of formal DFS, such as savings and checking accounts, which allow people to conduct basic transactions, save, obtain credit and insure against risks; this access is crucial for FI, as it allows people to participate in the formal economy and improve their financial well-being (Adil & Jalil, 2020).

DFS usage is the adoption and use of DFS through digital channels, such as personal computers, cell phones or trusted digital payment systems; these services enable more convenient, cheaper and faster financial transactions, and are a crucial avenue for increasing FI, especially in underserved areas (Semenog, 2021).

The impact on economic stability is the expansion of access to DFS can contribute to macroeconomic stability by allowing greater risk diversification, facilitating economic growth, and reducing poverty and inequality; however, if not accompanied by adequate regulation, it can pose risks to a country's financial stability (Said *et al.* 2019).

FI policies and regulations focuses on policies created in order to make DFS accessible to all groups of society, with special emphasis on those most disadvantaged; within these policies are actions such as lowering the capital criteria for financial institutions (Anarfo *et al.* 2020).

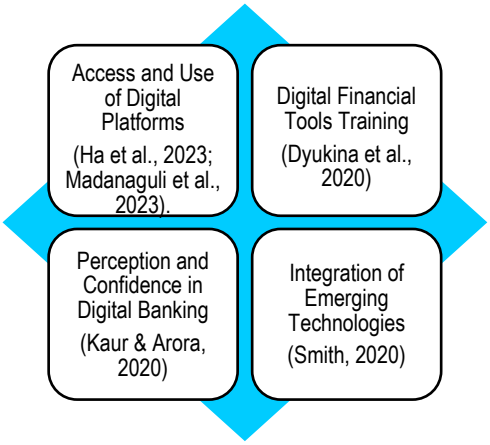
2. Research Methodology

The research had an applied typology, focusing on solving concrete problems related to money management, financial behavior and FI decisions among construction workers. Its main objective was to develop practical strategies and solutions that enabled workers to improve their financial literacy.

It had a quantitative approach, which implies the collection of numerical data to obtain accurate and objective findings; the design was non-experimental, since variables were not manipulated, but observed as they exist in the natural environment. In addition, the research was cross-sectional and took place at a single point in time, specifically during the duration of the survey.

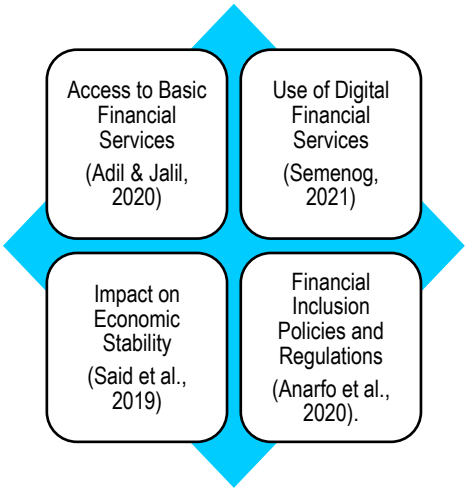
The scope of the research was descriptive, as it focused on detailing the current situation of Peruvian construction workers in terms of their financial situation and FI levels. The research also had an explanatory component, which made it possible to evaluate how the DFE influences the FI of construction workers. In the causal correlational aspect, it analyzed the relationships between various financial factors and identified strategies that favored good financial management and the adoption of good financial habits.

Figure 1. Dimensions of digital financial education



Source: Prepared with data from the literature review.

Figure 2. Dimensions of financial inclusion



Source: Prepared with data from the literature review.

The population consisted of 190 self-employed construction workers in Peru, representing a homogeneous group in terms of occupation and employment status, which allowed us to obtain meaningful and relevant data. All self-employed construction workers in Peru, between the ages of 18 and 60, with at least one year of work experience in the construction sector and permanent residence in the district are included. In addition, they must be available to participate in the survey at the designated time. All salaried workers working in public or private companies in Peru are excluded, as well as those construction workers with less than one year of work experience. Those under 18 years of age and those over 60 years of age, as well as temporary or non-permanent residents of Peru will not be considered. Also excluded are those who are unable to participate in the survey at the indicated time.

To obtain the sample, the inclusion and exclusion criteria were taken into account, the sample was delimited where the calculation of proportions was applied with a finite population or of known size, resulting in 128 workers in the construction sector in Peru, who were the sample considered for this work. Simple random sampling was used, which allowed the researchers to consider the workers who were present at the time of the survey.

A survey was used as a method and a questionnaire as a tool, which contains questions designed to obtain specific details about the subject of the study. Two tests were carried out, one for the DFE and the other for the FI. The procedures applied to two questionnaires, which were previously validated by expert judgment. After obtaining reliability, the questionnaires were applied to the collaborators. There were two questionnaires of 20 questions each, with a Likert-type rating scale.

Methods for data analysis; the data were subjected to an analysis process using both Microsoft Excel spreadsheets and SPSS statistical software; these tools allowed the evaluation of the data collected, facilitating the identification of the levels of influence between variables and indicators. The combined use of these platforms ensured accuracy and reliability in the interpretation of the results.

Ethical aspects:

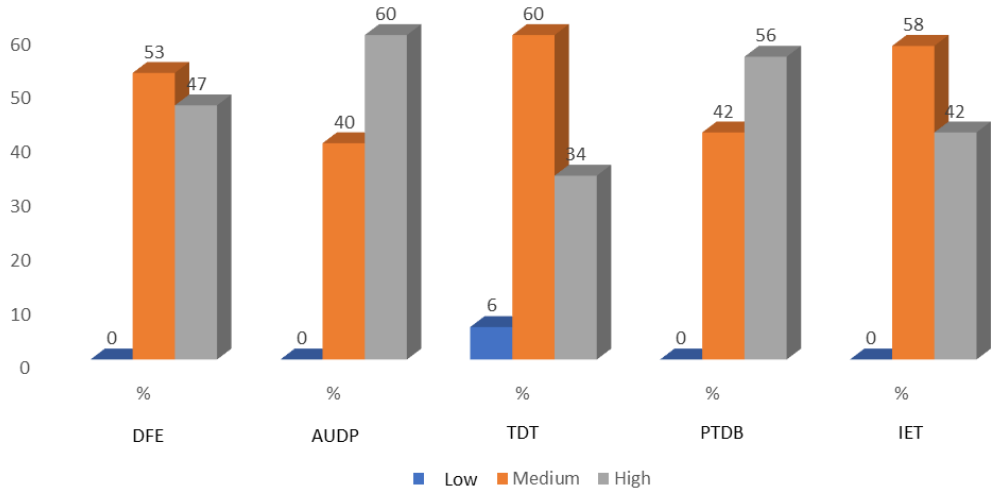
Autonomy, because it recognizes the right of individuals to exercise control over their own lives and bodies. In the field of research, this principle implies obtaining adequate informed consent from participants, ensuring that they understand the details of the study, its risks and benefits, and are free to decide to participate or withdraw without coercion.

Beneficence, because it implies the active promotion of well-being, the prevention of harm and the maximization of positive outcomes, considering the values and preferences of the individual involved. Non-maleficence, because it underscores the level of responsibility of researchers to avoid deliberately causing harm and to prioritize the well-being and safety of the individuals involved.

Justice, because it distributes benefits and burdens equitably, ensuring that resources and opportunities are equally available to all, without unfairly discriminating against study participants. Law explored how these guiding principles influence the interpretation and application of the law, as well as their crucial role in the consolidation of fundamental rights.

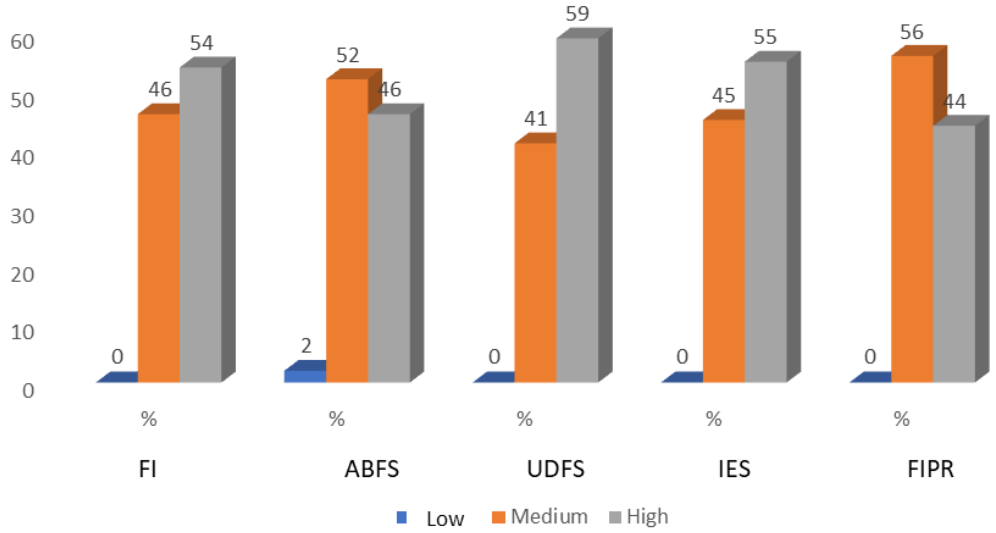
4. Research Results

Figure 3. Analysis of the digital financial education of construction sector workers in Peru



Note: DFE: digital financial education; AUDP: access and use of digital platforms; TDT: training in digital tools; PTDB: perception and trust in digital banking; IET: integration of emerging technologies.
Source: Authors' compilation with the research data

Figure 4. Analysis of the financial inclusion of construction sector workers in Peru.



Note: FI, financial inclusion; ABFS: access to basic financial services; UDFS: use of digital financial services; IES: impact on economic stability; FIPR: financial inclusion policies and regulations.
Source: Authors' compilation with the research data

Table 1. Model summary: influence of access to and use of digital platforms, training in digital financial tools, perception of and trust in digital banking, and integration of emerging technologies on financial inclusion of workers

Model	R	R square	Adjusted R-squared	Standard error of the estimate	Statistics of change					Durbin-Watson
					Change in R-squared	Change in F	gl1	gl2	Sig. change in F	
1	,615[a]	0.378	0.358	0.401	0.378	18.671	4	123	0.000	1.740
a. Predictors: (Constant), Integration of Emerging Technologies, Access to and Use of Digital Platforms, Training in Digital Financial Tools, Perception and Trust in Digital Banking.										
b. Dependent variable: financial inclusión										

Source: Authors' compilation with the research data

Table 2. Linear regression (ANOVA) influence of access to and use of digital platforms, training in digital financial tools, perception and trust in digital banking, and integration of emerging technologies on financial inclusion of workers

Model		Sum of squares	gl	Root mean square	F	Sig.
1	Regression	11.983	4	2.996	18.671	,000[b]
	Residual	19.736	123	0.160		
	Total	31.719	127			

a. Dependent variable: financial inclusión

b. Predictors: (Constant), Integration of Emerging Technologies, Access to and Use of Digital Platforms, Training in Digital Financial Tools, Perception and Trust in Digital Banking.

Source: Authors' compilation with the research data

Table 3. Model coefficients: influence of access to and use of digital platforms, training in digital financial tools, perception of and trust in digital banking, and integration of emerging technologies on financial inclusion of workers

		Unstandardized coefficients		Standardized coefficients		
Model		B	Error	Beta	t	Sig.
1	(Constant)	0.533	0.272		1.960	0.052
	AUDP	0.028	0.077	0.028	0.363	0.717
	TDT	0.113	0.069	0.127	1.644	0.103
	PTDB	0.388	0.082	0.385	4.716	0.000
	IET	0.281	0.080	0.279	3.531	0.001

a. Dependent variable: financial inclusion

Source: Authors' compilation with the research data

Table 4. Summary of the model: influence of digital financial education on the financial inclusion of construction sector workers in Peru

Model	R	R square	Adjusted R-squared	Standard error of the estimate	Statistics of change					Durbin-Watson
					Change in R-squared	Change in F	gl1	gl2	Sig. change in F	
1	,541[a]	0.292	0.287	0.422	0.292	52.013	1	126	0.000	1.885

a. Predictors: (Constant), digital financial education.

b. Dependent variable: financial inclusion

Source: Authors' compilation with the research data

Table 5. Linear regression (ANOVA): influence of digital financial education on the financial inclusion of construction sector workers in Peru

Model		Sum of squares	gl	Root mean square	F	Sig.
1	Regression	9.268	1	9.268	52.013	,000[b]
	Residual	22.451	126	0.178		
	Total	31.719	127			

a. Dependent variable: financial inclusion

b. Predictors: (Constant), digital financial literacy.

Source: Authors' compilation with the research data

Table 6. Coefficients of the model: influence of digital financial education on the financial inclusion of construction sector workers in Peru

		Unstandardized coefficients		Standardized coefficients		
Model		B	Error	Beta	t	Sig.
1	(Constant)	1.216	0.188		6.456	0.000
	VARIND: EFD	0.539	0.075	0.541	7.212	0.000

a. Dependent variable: FI

Source: Authors' compilation with the research data

5. Discussions

The results of the study in Peru show a moderate influence between digital financial literacy and financial inclusion, with an R-value of 0.541 and an R-squared of 0.292, indicating that 29.2% of the variability in financial inclusion is explained by digital financial literacy. The adjusted R-squared is 0.287, with a standard error of 0.422, indicating moderate model accuracy. The model is highly significant ($p < 0.001$), with an F-value of 52.013.

ANOVA analysis and coefficients confirm the significant influence of digital financial literacy on financial inclusion, with an unstandardized coefficient of 0.539, a t-value of 7.212 and a significance of 0.000. Studies support these findings. Tabassum and Ali (2024) showed that digitization of financial services improves financial inclusion among construction workers. Fauziyah *et al.* (2024) found a positive correlation between digital financial literacy and responsible financial behavior. Falaiye *et al.* (2024) indicated that EFD reduces financial exclusion by 40%.

Becker and Mincer's human capital theory emphasizes the importance of education and training as essential investments. In the context of EFD, this theory stresses the importance of technological competencies to access and effectively use online platforms (Leoni, 2023). Online workshops and courses improve technical competence, perception and confidence in digital banking (Chriswick, 2024).

Data show that construction workers in Peru have a good level of digital financial literacy, with 60% having high levels of access to digital platforms and 56% having high confidence in digital banking. However, there is a need to improve training in digital tools and the integration of emerging technologies for greater financial inclusion.

The regression model used shows an R-value of 0.615, with an R-squared of 0.378, indicating that 37.8% of the variability of financial inclusion is explained by variables such as the integration of emerging technologies and trust in digital banking. The coefficients of the model indicate that perception and trust in digital banking (unstandardized coefficient = 0.388, t = 4.716, p = 0.000) and integration of emerging technologies (unstandardized coefficient = 0.281, t = 3.531, p = 0.001) significantly influence financial inclusion. However, access to and use of digital platforms and training in digital financial tools do not show a significant influence.

The results suggest that construction workers in Peru have a high level of financial inclusion, with a notable use of digital services and a positive impact on their economic stability. However, there is a need to improve access to basic financial services and strengthen financial inclusion policies.

Other studies, such as Widyastuti *et al.* (2024), show that digital financial literacy and demographic factors influence financial inclusion. Vasile *et al.* (2021) correlate digital financial literacy with increased knowledge and responsible financial behavior, essential for sustainable financial security. These studies provide an empirical basis applicable in Peru to develop digital financial literacy programs that promote greater financial inclusion and inclusive economic growth.

Conclusions and Further Research

The research reveals that digital financial literacy has a moderate influence on the financial inclusion of construction workers in Peru, with an R-value of 0.541 and an R-squared of 0.292. The model is highly significant ($p < 0.001$), demonstrating that digital financial literacy is a determinant factor for financial inclusion. The model is highly significant ($p < 0.001$), demonstrating that digital financial literacy is a determinant of financial inclusion. Perception and confidence in digital banking, as well as integration of emerging technologies, are the most influential factors in this area. Although workers have good digital financial literacy, the need to improve training in digital tools and the integration of new technologies is highlighted.

The research fills important gaps in the existing literature. Specifically, it addresses how digital financial literacy affects financial inclusion in the construction sector, an area that has been little explored to date. It also examines the impact of demographic factors such as age, income and occupation on digital financial inclusion, aspects that have not been sufficiently explored in previous studies.

This study one of the few in the Peruvian regional literature to examine the impact of digital financial education on financial inclusion specifically among self-employed workers in Peru's construction sector. It identified key factors, such as digital literacy and trust in digital banking, that influence financial inclusion in this underserved group. The findings highlighted the importance of targeted digital financial education to improve access to financial services, contributing to economic inclusion and supporting Sustainable Development Goal 8. The study's results are relevant for policymakers and financial institutions aiming to enhance financial access in informal labor sectors.

However, the research has some limitations. The sample focuses on construction workers in Peru, which may restrict the generalizability of the results to other regions or sectors. In addition, the accuracy of the data may

be affected by the self-reported nature of the surveys used. It is also recognized that other variables that could influence financial inclusion, such as access to technological infrastructure and institutional support, were not explored.

For future lines of research, it is proposed to expand the sample and diversify the sectors studied. It is recommended to explore variables such as educational level, type of employment, job stability, internet access, possession of mobile devices, government policies and financial education programs. It is also suggested to conduct longitudinal studies that evaluate the evolution of digital empowerment and the impact of fintechs and new technologies on financial inclusion. In addition, the influence of psychosocial factors such as trust in technology and attitudes towards financial risk should be considered.

Finally, several initiatives of high value for science are proposed. These include developing specific digital financial literacy programs for construction workers, formulating public policies that promote digital financial literacy, developing and promoting digital apps and platforms to improve financial inclusion, conducting detailed studies on the impact of fintechs, and encouraging interdisciplinary research that approaches digital financial literacy from multiple perspectives to gain a more complete understanding of its impact.

Acknowledgments

The authors thank Cesar Vallejo University for its support.

Credit Authorship Contribution Statement

Neptalí Rojas Ortiz: Conceptualization, Investigation, Methodology, Formal analysis, Writing.
Joél Vásquez Torres: Conceptualization, Investigation, Methodology, Formal analysis, Writing.
Víctor Hugo Puican Rodríguez: Conceptualization, Investigation, Methodology, Formal analysis, Writing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies in the writing process before submission, but only to improve the language.

References

[1] Adil, F., & Jalil, A. (2020). Determining the Financial Inclusion Output of Banking Sector of Pakistan - Supply-Side Analysis. *Economies, 8*(2): 1-18. DOI: https://doi.org/10.3390/economies8020042

[2] Amaliah, I., *et al.* (2024). Does digital financial inclusion forecast sustainable economic growth? Evidence from an emerging economy. *Journal of Open Innovation: Technology, Market, and Complexity, 10*(2): 1-17. DOI: https://doi.org/10.1016/j.joitmc.2024.100262

[3] Anarfo, E., Abor, J., & Osei, K. (2020). Financial regulation and financial inclusion in Sub-Saharan Africa: Does financial stability play a moderating role? *Research in International Business and Finance, 51*: 1-21. DOI: https://doi.org/10.1016/J.RIBAF.2019.101070

[4] Basory, H., Manalu, S., & Saputri, D. (2023). The Influence of Trust, Technology Understanding, and Interconnected Network on the Digital Banking Services Usage in Pujiharjo Village, Tirtoyudo Subdistrict. *Indonesian Journal of Business Analytics, 3*(4): 1235-1250. DOI: https://doi.org/10.55927/ijba.v3i4.5159

[5] Beller, A., Grossbard, S., & Idmansour, M. (2024). Women, Economics, and Household Economics: The Relevance of Workshops Founded by Nobel Laureate Gary Becker, and of Jacob Mincer. *Journal of Family and Economic Issues*, 1-14. DOI: https://doi.org/10.1007/s10834-023-09941-9

[6] Benedetta, G., Palmieri, E., Miami, S., & Stefanelli, V. (2024). The impact of FinTech innovation on digital financial literacy in Europe: Insights from the banking industry. *Research in International Business and Finance, 69*: 1-15. DOI: https://doi.org/10.1016/j.ribaf.2024.102218

[7] Chen, H. (2022). Construction of a Novel Digital Platform for Smart Financial Talent Training Under the Big Data Environment. *Second International Conference on Artificial Intelligence and Smart Energy (ICAIS)*, 569-572. DOI: https://doi.org/10.1109/ICAIS53314.2022.9742872

[8] Chriswick, B. (2024). Estimating returns to schooling and experience: a history of thought. *Education Economics*, 1-15. DOI: https://doi.org/10.1080/09645292.2024.2326015

[9] Condori, H., *et al.* (2023). Educación financiera y toma de decisiones en Contadores Públicos, Puno - Perú. *Ciencia Latina Revista Científica Multidisciplinar, 7*(4): 2293-2316. DOI:https://doi.org/10.37811/cl_rcm.v7i4.7077

[10] Cotrina, R., & Pumarrumi, A. (2020). Billetera Digital: Estrategia de Inclusión Financiera en las micro y pequeñas empresas del Perú. *Revista Colombiana De Contabilidad - ASFACOP, 8*(15): 31-52. DOI:https://doi.org/10.56241/asf.v8n15.170

[11] Dash, A., & Mohanta, G. (2024). Fostering financial inclusion for attaining sustainable goals: What contributes more to the inclusive financial behaviour of rural households in India? *Journal of Cleaner Production, 449*: 1-19. DOI: https://doi.org/10.1016/j.jclepro.2024.141731

[12] Díaz Tantalean, N. A., García Morales, F. N., & Calvanapón Alva, F. A. (2022). Financial culture and indebtedness of the clients of the savings and credit cooperatives. *Sapienza: International Journal of Interdisciplinary Studies*, *3*(2): 826–835. DOI: https://doi.org/10.51798/sijis.v3i2.411

[13] Dyukina, T., Kordovich, V., & Diukina, I. (2020). Features of Training in Financial Management Technologies in the Digital Economy. *Advances in Economics, Business and Management Research*, 31-34. DOI:https://doi.org/10.2991/aebmr.k.200423.007

[14] Falaiye, T., *et al.* (2024). Financial Inclusion Through Technology: A Review Of Trends In Emerging Markets. *International Journal of Management & Entrepreneurship Research, 6*(2): 1-15. DOI:https://doi.org/10.51594/ijmer.v6i2.776

[15] Fauziyah, A., Bidiman, A. H., Sartika, S., Khairunnisa, S., & Aty, S. (2024). Digital Financial Literacy and Digital Financial Inclusion: Efforts to Overcome Challenges After the Covid-19 Pandemic and Increase the Independence of Financial Management. *Advances in Economics, Business and Management Research*, 1-18. DOI: https://doi.org/10.2991/978-94-6463-443-3_18

[16] Gaspar-Barrios, D., Condor-Huaranga, A., Moore-Blanco, C., & Orosco-Fabian, R. (2024). Educación financiera en jóvenes de educación superior. *Revista Internacional de Investigación en Ciencias Sociales, 20*(1): 1-14. DOI: https://doi.org/10.18004/riics.2024.junio.37

[17] Golden, & Cordie, L. (2022). Digital Financial Literacy. *Adult Literacy Education: The International Journal of Literacy, Language, and Numeracy*, 20-26. DOI: https://doi.org/10.35847/wgolden.lcordie.4.3.20.

[18] Ha, S., Park, Y., Kim, J., & Kim, S. (2023). Research trends of digital platforms: A survey of literature from 2018 to 2021. *Telecommunications Policy, 47*(8): 1-17. DOI: https://doi.org/10.1016/j.telpol.2023.102543

[19] Herrera, D., Uribe, J., & Hidalgo, D. (2023). Pagos digitales e inclusión financiera: Un estudio correlacional en microempresarios del distrito de Pueblo Libre - Lima, Perú 2022. *Industrial Data, 26*(2): 267-277. DOI: http://dx.doi.org/10.15381/idata.v26i2.25582

[20] Juliao, J., Ayllon, T., & Gaspar, M. (2022). Financial Inclusion Through Digital Banking: The case of Peru. *Innovations in Industrial Engineering II*, 294-304. DOI: https://doi.org/10.1007/978-3-031-09360-9_24

[21] Kaur, S., & Arora, S. (2020). Role of perceived risk in online banking and its impact on behavioral intention: trust as a moderator. *Journal of Asia Business Studies, 15*(1): 1-30. DOI: 10.1108/jabs-08-2019-0252

[22] Leoni, S. (2023). A Historical Review of the Role of Education: From Human Capital to Human Capabilities. *Review of Political Economy*, 1-18. DOI: https://doi.org/10.1080/09538259.2023.2245233

[23] Madanaguli, A., Parida, V., Sjodin, D., & Oghazi, P. (2023). Literature review on industrial digital platforms: A business model perspective and suggestions for future research. *Technological Forecasting and Social Change, 194*: 1-15. DOI: https://doi.org/10.1016/j.techfore.2023.122606

[24] Mohammed, F., & Salim, W. (2023). Digital Platforms and the Improvement of Learning Outcomes: Evidence Extracted from Meta-Analysis. *Sustainability, 15*(2): 1-18. DOI: https://doi.org/10.3390/su15021305

[25] Náñez, S., Vasquez, J., Gallegos, L., & Muñoz, N. (2024). What Factors Are Limiting Financial Inclusion and Development in Peru? Empirical Evidence. *Economies, 12*(4): 1-17. DOI:https://doi.org/10.3390/economies12040093

[26] Obinna, C. (2024). Neo-liberalism, human capital theory and the right to education: Economic interpretation of the purpose of education. *Social Sciences & Humanities Open, 9*: 1-17. DOI:https://doi.org/10.1016/j.ssaho.2023.100734

[27] Olano, M., *et al.* (2024). The Need for Innovation in Financial Education: A Study of Household Indebtedness in Peru. *Revista De Gestão Social E Ambiental, 18*(1), e04919. DOI: https://doi.org/10.24857/rgsa.v18n1-081

[28] Paredes-Valverde, Y., Quispe-Herrera , R., Estrada-Araoz, E. G., Quispe-Paredes, D. R., & Quispe-Cabrera, K. V. (2024). Impact of informal trade on labor employability in the Peruvian Amazon economy. *Sapienza: International Journal of Interdisciplinary Studies*, *5*(2), e24045. DOI: https://doi.org/10.51798/sijis.v5i2.745

[29] Ramirez-Asis, H., Castillo-Picon, J., Miranda, J., Herrera, J., & Acuña, W. (2024). Socioeconomic Factors and Financial Inclusion in the Department of Ancash, Peru, 2015 and 2021. *Technological Innovations for Business, Education and Sustainability*, 249-264. DOI: https://doi.org/10.1108/978-1-83753-106-620241017

[30] Said, A., Emara, N., & Pearlman, J. (2019). On the Impact of Financial Inclusion on Financial Stability and Inequality: The Role of Macroprudential Policies. *Development Economics: Macroeconomic Issues in Developing Economies e Journal*, 1-32. DOI: https://doi.org/10.2139/ssrn.3814335

[31] Salas, A., Miranda, J., Saldaña, R., & Diaz, R. (2022). Las FINTECH y el proceso de inclusión financiera en Perú. *QUIPUKAMAYOC, 30*(63): 69-79. DOI: https://doi.org/10.15381/quipu.v30i63.24043

[32] Sapre, N. (2022). Financial inclusion: philosophical and methodological underpinnings. *Qualitative Research in Financial Markets., 15*(3): 445-452. DOI: https://doi.org/10.1108/qrfm-10-2022-0179

[33] Semenog, A. (2021). Digital Financial Services As The Main Product Of Fintech Companies. *Visnik Sums'kogo deržavnogo unìversitetu.*, 142-152. DOI: https://doi.org/10.21272/1817-9215.2021.4-17

[34] Smith, S. (2020). Emerging Technologies And Implications For Financial Cybersecurity. *International Journal of Economics and Financial Issues, 10*(1): 27-32. DOI: https://doi.org/10.32479/ijefi.8844

[35] Suhrab, M., Chen, P., & Ullah, A. (2024). Digital financial inclusion and income inequality nexus: Can technology innovation and infrastructure development help in achieving sustainable development goals? *Technology in Society, 76*: 1-16. DOI: https://doi.org/10.1016/j.techsoc.2023.102411

[36] Tabassum, T., & Ali, M. (2024). Financial Literacy in the Age of Digital Finance: A Global Perspective. *Academic Journal on Business Administration, Innovation & Sustainability, 4*(3): 30-36. DOI:https://doi.org/10.69593/ajbais.v4i3.79

[37] Tondeur, P., *et al.* (2021). Quality criteria for conceptual technology integration models in education: bridging research and practice. *Educational Technology Research and Development, 69*: 2178-2208. DOI:https://doi.org/10.1007/s11423-020-09911-0

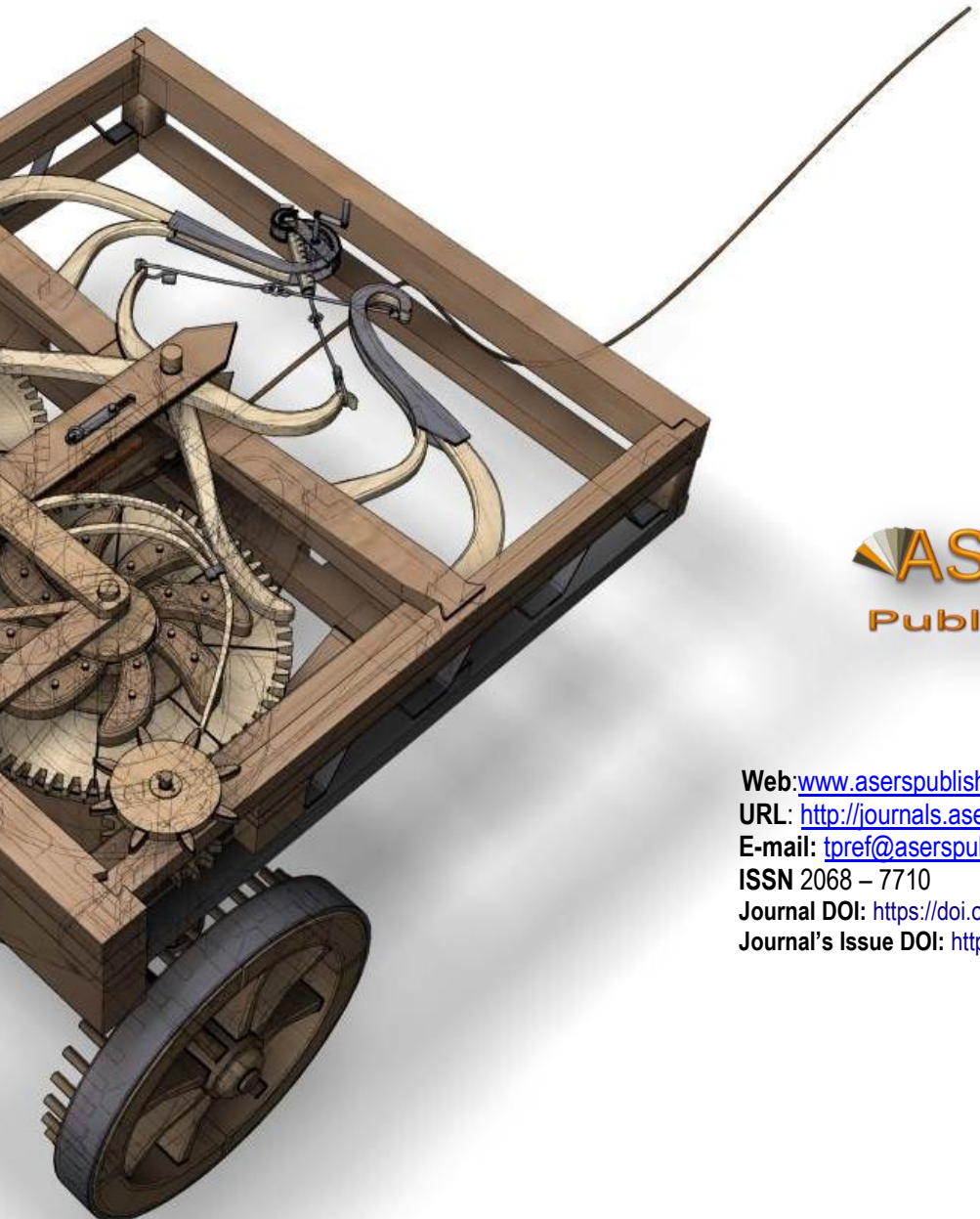
[38] Vasile, V., Panait, M., & Apostu, S. (2021). Financial Inclusion Paradigm Shift in the Postpandemic Period. Digital-Divide and Gender Gap. *Int. J. Environ. Res. Public Health, 18*(20): 1-17. DOI:https://doi.org/10.3390/ijerph182010938

[39] Wan, R., & Abdul, S. (2023). Digital Financial Literacy Among Young Adults in Malaysia. *International Business Education Journal, 16*(2): 115-126. DOI: https://doi.org/10.37134/ibej.Vol16.2.9.2023

[40] Widyastuti, U., Respati, D., Dewi, V., & Mukti, A. (2024). The nexus of digital financial inclusion, digital financial literacy and demographic factors: lesson from Indonesia. *Cogent Business & Management, 11*(1): 1-15. DOI: https://doi.org/10.1080/23311975.2024.2322778

[41] Zaimovic, A., *et al.* (2024). Measuring Digital Financial Literacy. *Procedia Computer Science, 236*: 574-581. DOI: https://doi.org/10.1016/j.procs.2024.05.068

ASERS



ASERS Publishing

Web:www.aserspublishing.eu
URL: http://journals.aserspublishing.eu/tpref
E-mail: tpref@aserspublishing.eu
ISSN 2068 – 7710
Journal DOI: https://doi.org/10.14505/tpref
Journal's Issue DOI: https://doi.org/10.14505/tpref.v15.4(32).00