

# Theoretical and Practical Research in Economic Fields

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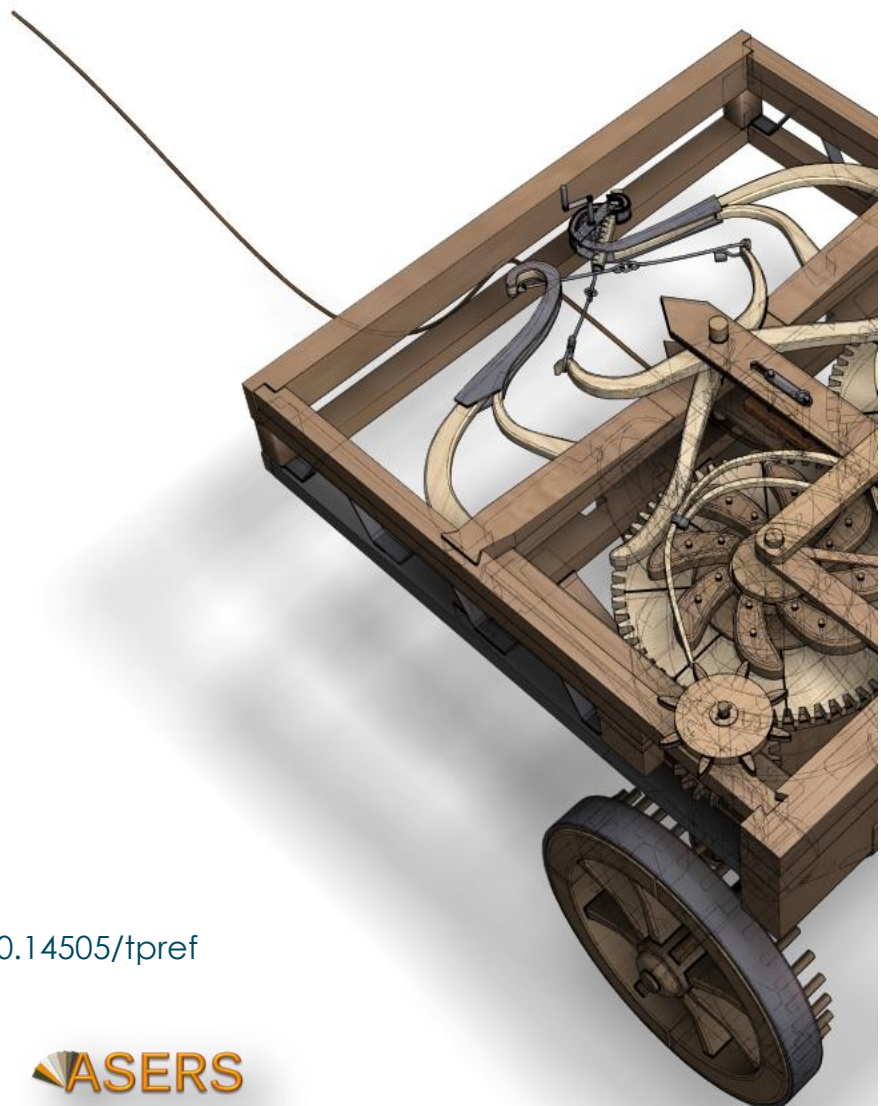
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## Financial Education in Amazonas: Evaluating Virtual and Traditional Methods

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**Abstract:** This research focused on examining how digital financial education, financial innovation, digital literacy, digital finance, and globalization influence face-to-face financial education in Bagua, Peru. The aim is to contribute to the fulfillment of the Sustainable Development Goal (SDG) related to quality education. The study uses a quantitative approach, and a descriptive-explanatory non-experimental design and data collected from 304 participants using a validated questionnaire. The results showed that digital financial education faces significant barriers, mainly due to the lack of connectivity and familiarity with digital tools; however, participants showed a strong preference for face-to-face financial education, although they also expressed a willingness to integrate digital methods; the analysis of the predictor variables revealed that digital financial education and digital finance positively influence face-to-face financial education, while financial innovation and

digital literacy did not show a significant influence. In conclusion, the results express the need for public policies and educational strategies that promote a hybrid model, compounding both digital and in-person learning, to improve financial inclusion in regions with technological gaps. Besides, globalization plays an important role but is not yet fully integrated into financial education.

**Keywords:** digital financial education; financial innovation; digital finance; globalization; financial inclusion; digitalization.

**JEL Classification:** J21; O33; Q56; A20.

## Introduction

Financial education has been established as a fundamental factor for the particular and economic development of individuals in modern societies, especially in the current digital context. Technological transformation and the advance of globalization have reconfigured access to financial information; it opens the way to digital financial education, which offers new opportunities to acquire key knowledge in areas such as finance, investment and personal data protection; however, the lack of this knowledge can lead to serious errors in financial decision-making that affect both individuals and the economy in general; the lack of financial knowledge has been identified as one of the factors that contribute to the inability of many people to effectively manage their assets and make appropriate decisions (Remund, 2010; Agasisti *et al.* 2023; Lusardi & Mitchell, 2014).

In this sense, digital financial education, both in-person and online, has become one of the most relevant skills in the 21st century, especially with the advancement of the technological and digital environment; the ability to efficiently manage personal assets has become an essential skill to work in the modern economic environment; furthermore, during the COVID-19 pandemic, many young people, initially were affected by the lack of access to digital media, excelled in developing financial skills through digital platforms once they adapted to the digital environment; however, in countries such as India, the lack of accessibility to technology aggravated financial problems, highlighting the digital divide that limits people's ability to access financial education (Kumar *et al.* 2022; Buccioli *et al.* 2021; Lusardi, 2015; Gouda, 2022).

Worldwide, Sconti (2022) and Ali & Ghildiyal (2023) argues that limited access to digital financial education remains a serious problem, even in advanced economies, such as rapid technological developments and the complexity of financial services exclude part of the population; this phenomenon is reflected in the case of older people, who face big difficulties adapting to new digital paradigms due to the demand complex for digital education and socioeconomic factors that make it hard to their access to modern financial services.

In the national context, although financial literacy is essential for efficient savings and investment management, many citizens lack the necessary knowledge to effectively manage their personal finances (Álvarez *et al.* 2022). According to INEI (2022), people with less access to digital services are the most affected by the lack of financial culture, which increases their vulnerability to financial problems. Salas & Ticlla (2022) point out that the lack of financial skills is directly related to poor entrepreneurial attitudes and the inability to properly manage financial resources.

This research examines the influence of digital financial education, financial innovation, digital literacy, digital finance, and globalization on face-to-face financial education in Bagua; this study supported the fulfillment of the Sustainable Development Goal (SDG) related to quality education, focusing on financial inclusion and strengthening the digital skills of the inhabitants of this region; in this context, it seeks to generate a deeper understanding of how these factors contribute to the financial literacy of the population in an increasingly globalized and digitalized environment.

## 1. Literature Review and Background

After a review of the scientific literature, there were several relevant studies related to financial education in digital and face-to-face contexts. As well as theories linked to financial behavior and learning. In that sense, Tan *et al.* (2025) found that virtual financial education in Portugal increased student satisfaction, supporting the government's decision to approve this modality, which favored the financial inclusion of mature students. Pillai *et al.* (2023) they found that digital financial education significantly affects financial decisions, although it had no direct impact on perceived financial well-being. Clark *et al.* (2025) showed that in-person courses generated more stable financial literacy than digital ones in the long term, but both were beneficial. In a study of Olano *et al.* (2024), digital financial education was found to improve e-banking behavior, although many participants had little confidence in their digital financial skills. Mohd & Halim (2023) concluded that the digitalization of financial education is key to economic growth, as it improves financial ecosystems through digital infrastructure.

Likewise, Bellocchi & Travaglini (2025) showed that the use of digital payments is correlated with financial literacy, especially among young individuals and urban residents with Internet access. Garcia-Santillan *et al.*

(2025) found that greater financial literacy improves users' money organization, while Cook *et al.* (2024) highlighted that Peruvian student have basic knowledge about savings, but less advanced skills related to financial security. Ramos *et al.* (2023) highlighted that financial education programs aimed at women support to financial inclusion and the development of human capital in households, while Castro *et al.* (2022) indicated that digital financial education was positively received by students during the pandemic, especially among those who were financially dependent on their parents.

According to theoretical perspective, the theory of behavioral finance, related to financial literacy, highlights the importance of having financial knowledge to make informed decisions (Xiao y Kumar, 2023). The theory of ubiquitous learning, which focuses on the acquisition of knowledge through digital platforms, has also been taken into account (Ortiz *et al.* 2024). Regarding face-to-face financial education, theories such as autonomous learning have been addressed (Kallenos *et al.* 2025) and social learning (Zhou *et al.* 2023), which suggest that social interactions and group environments increases the acquisition of financial knowledge. Regarding digital financial literacy, the definition provided by Van Nguyen *et al.* (2022), which describes digital financial literacy as the set of skills, attitudes and knowledge necessary to make efficient financial decisions; also, the theory of digital literacy, according to Zahoor (2023), emphasizes the importance of digital skills to understand and use financial information. Regarding globalization, Choudhury (2022) highlights how the interaction and integration of countries drives economic and social changes that affect financial literacy and global financial inclusion. The studies have also identified various indicators, such as the availability of credit (Bhattacharyaa *et al.* 2023), indebtedness (Abdallah *et al.* 2025) and liquidity (Roy *et al.* 2022), which are directly related to individual and collective financial development.

Based on these backgrounds and theories, the following general hypothesis is proposed: H1: The factors of digital financial education, financial innovation, digital literacy, digital finance and globalization exert a positive and significant influence on the face-to-face financial education of people in Bagua, improving their financial knowledge, skills and attitudes, supporting adequate decision-making and financial inclusion.

## 2. Materials and Methods

The study was framed by expanding knowledge about the influence of digital and face-to-face financial education on the population of Bagua, that is a context explored a little in previous research. In this sense, we sought to understand deeply how people access and use financial education in an increasingly digitalized environment, which was crucial to promote inclusive financial education in regions with diverse digital and socioeconomic gaps; in addition, numerical data and statistical analysis were collected to test the hypotheses about the influence between the variables, providing relevance evidence on the effectiveness of financial education models in urban and rural contexts.

Furthermore, the variables were not deliberately modified or controlled but rather observed in their natural context; this approach was innovative because, unlike previous research focused on urban or highly connected contexts, the study addressed the influence between digital and in-person financial education in a region with socioeconomic and cultural characteristics, such as Bagua, where access to digital services was limited; this perspective allowed for a more complete and nuanced view of the influence of educational tools on financial habits in contexts of digital inequality.

The sample of 304 people was an exact representation of the population of Bagua, which allowed for a detailed view of citizens' perceptions and attitudes towards financial education; this approach was relevant, as it targeted a specific segment of the population in a geographic and cultural context that had been little researched in relation to digital and in-person financial education; non-probabilistic sampling, focused on the availability and willingness of participants, ensured that the data collected was significant for the study, it allowed a direct connection with the reality of the territory; the instrument was a questionnaire validated by experts, it was specifically adapted to the context of Bagua, which ensured its cultural relevance and relevance in measuring digital and in-person financial education.

At the methodological level, the research proposed a significant advance by integrating descriptive and inferential analysis to explore how the variables of digital financial education, financial innovation, digital literacy and globalization influenced the face-to-face financial education of the population of Bagua; this approach allowed us not only to describe the levels of knowledge, but also to infer the relationships between the factors that affect the financial behavior of individuals; in addition, ethical principles were considered, ensuring good research practices and transparent manners, respecting the autonomy of the participants and guaranteeing the confidentiality of their responses.

### 3. Research Results

Table 1, showing mean scores above 2.2 on a scale of 1 to 3, shows that digital and in-person financial education are generally well received. The more traditional approach seems to be slightly preferred in the VET dimension (in-person financial education), which has the highest mean score of 2.48. The data show that participants tend to score higher, with moderate standard deviations and negative skewness across all dimensions. The distribution is very even, with few outliers, as indicated by the negative kurtosis values. The results show that both teaching methods are well received, with a slight preference for face-to-face classes.

Table 1. Descriptive statistics on digital and in-person financial education

	N	Range	Minimum	Maximum	Average		Standard deviation	Variance	Asymmetry		Kurtosis	
					Statistical	Standard error			Statistical	Standard error	Statistical	Standard error
EFD	304	2	1	3	2.38	0.031	0.549	0.301	-0.094	0.140	-0.876	0.279
IF	304	2	1	3	2.40	0.032	0.560	0.314	-0.228	0.140	-0.852	0.279
AD	304	2	1	3	2.33	0.032	0.565	0.319	-0.111	0.140	-0.658	0.279
FD	304	2	1	3	2.34	0.036	0.623	0.389	-0.384	0.140	-0.663	0.279
G	304	2	1	3	2.27	0.032	0.564	0.318	-0.039	0.140	-0.482	0.279
EFP	304	2	1	3	2.48	0.030	0.526	0.277	-0.182	0.140	-1.359	0.279
N valid (by list)	304											

Note: Prepared with SPSS data V 27 - 2025

Table 2 reveals that the combination of the independent variables - globalization, financial innovation, digital literacy, digital finance and digital financial education - has a significant impact on in-person financial education, as shown by the statistically significant model ( $F = 30.625$ ,  $p < 0.001$ ) in the analysis of variance (ANOVA). The high F-value and p-value, both less than 0.001, demonstrate the explanatory power of the model. These results point to the fact that elements related to digital transformation and globalization have a direct impact on how mainstream financial education is perceived and how effective it is.

Table 2. An analysis of Variance (ANOVA) to assess the influence of globalization, financial innovation, digital literacy, digital finance and digital financial education on face-to-face financial education.

Model	Sum of squares	gl	Root mean square	F	Sig.
1 Regression	28.457	5	5.691	30.625	,000 <sup>b</sup>
Residue	55.382	298	0.186		
Total	83.839	303			

a. Dependent variable: VARDEP: IN-PERSON FINANCIAL EDUCATION

b. Predictors: (Constant), VAR5: Globalization, VAR2: Financial innovation, VAR3: Digital literacy, VAR4: Digital Finance, VARINDEP: Digital Financial Education

Table 3 reveals that digital financial education (DFE) is the most influential and statistically significant predictor of in-person financial education ( $\beta = 0.314$ ,  $p < 0.001$ ). Both globalisation (G) and digital finance (FD) have positive and substantial effects ( $p = 0.001$  and  $p = 0.028$ , respectively). Both effects are statistically significant. In contrast, financial innovation (FI) and digital literacy (DL) do not have a statistically significant influence. No evidence of multicollinearity problems was found.

Table 4 shows that based on factors such as globalization, financial innovation, digital literacy, digital finance and digital financial literacy, the regression model explains 33.9% ( $R^2 = 0.339$ ) of the variance of in-person financial literacy. There are also predictors including digital financial literacy. The Durbin-Watson statistics, equal to 1.747, suggest that the residuals are not autocorrelated. There is a strong shift at  $F = 30.625$ , which confirms that the model is statistically significant ( $p < 0.001$ ). This indicates that the model fits the data well overall.



Table 3. Regression coefficients to assess the influence of digital financial education, financial innovation, digital literacy, digital finance and globalization on face-to-face financial education.

Model	Unstandardized coefficients		Standardized coefficients			Correlations			Collinearity statistics	
	B	Desv. Error	Beta	t	Sig.	Zero order	Partial	Part	Tolerance	VIF
1 (Constante)	1.006	0.147		6.862	0.000					
EDF	0.301	0.076	0.314	3.957	0.000	0.544	0.223	0.186	0.353	2.832
IF	-0.049	0.051	-0.052	-0.953	0.341	0.244	-0.055	-0.045	0.741	1.350
AF	0.080	0.051	0.086	1.577	0.116	0.331	0.091	0.074	0.742	1.348
FD	0.173	0.052	0.206	3.314	0.001	0.466	0.189	0.156	0.576	1.736
G	0.125	0.056	0.134	2.208	0.028	0.427	0.127	0.104	0.606	1.650

a. Dependent variable: VARDEP: IN-PERSON FINANCIAL EDUCATION.

Table 4. Summary of the regression model to assess the influence of digital financial education, globalization, financial innovation, digital literacy, digital finance on face-to-face financial education

Model	R	R square	R square tight	Standard error of the estimate	Statistics of change					Durbin-Watson
					Change in R squared	Change in F	gl1	gl2	Sig. Change in F	
1	.583 <sup>a</sup>	0.339	0.328	0.431	0.339	30.625	5	298	0.000	1.747

a. Predictors: (Constant), VAR5: Globalization, VAR2: Financial innovation, VAR3: Digital literacy, VAR4: Digital Finance, VARINDEP: DIGITAL FINANCIAL EDUCATION

b. Dependent variable: VARDEP: IN-PERSON FINANCIAL EDUCATION

#### 4. Discussion

The result of the descriptive analysis provides a clear and revealing view of the respondents' perception regarding digital and in-person financial education in Bagua. It revealed both general trends and relevant particularities; at a general level, a slight preference was observed for traditional methods over digital alternatives, a finding that could be linked to the low familiarity with digital technologies, which is consistent with the perspective of Maldonado *et al.* (2023). It underlines the importance of digital financial education in more advanced students; the Digital Financial Education variable showed a mean of 2.38, reflecting a moderate perception of its accessibility and relevance; the notable dispersion in the responses (standard deviation of 0.549) suggests unequal exposure to digital tools, a phenomenon also observed by Pillai *et al.* (2023), who found that digital financial education influences financial decisions, although it does not always improve perceived financial well-being.

Regarding financial innovation, the average of 2.40 shows a slight improvement in the perception towards digital financial education, aligning to what was indicated by Sconti (2022), who observed that face-to-face methods tend to generate more stable financial education than digital ones; on the other hand, digital literacy had the lowest mean (2.33) and the highest standard deviation (0.565), which reflects that many participants consider themselves inexperienced in the use of digital tools; this result supports the claim of Van Nguyen *et al.* (2022), who highlighted that digital competence as crucial for making effective financial decisions; the variable Face-to-face Financial Education obtained an average of 2.48, that means a positive perception towards traditional methods, in line with the findings of Ramos *et al.* (2023), who found that face-to-face programs favor the development of human capital and financial inclusion; the lowest finding was in Globalization, with a mean of 2.27, suggesting that participants do not directly associate globalization with significant changes in their financial education; this could reflect a disconnect between global effects and local realities, as indicated Choudhury (2022), noting that globalization drives economic changes that affect financial education, but these effects are not strongly perceived in areas with limited access to globalized financial information.

The analysis of variance (ANOVA) confirmed the relevance of the proposed model, which included the variables Digital financial education, Financial innovation, Digital literacy, Digital finance and Globalization (F=30.625, p<0.001); this highlights the significant influence of these variables on the variability in in-person financial education, although the presence of a significant proportion of unexplained variability suggests that other factors not yet considered could be affecting participants' perceptions.

Finally, the results of the multiple regression confirmed that Digital Financial Education has a positive and significant impact on In-person Financial Education (coefficient of 0.301,  $p=0.000$ ), supporting the importance of digitalization in financial education, as suggested by Mohd & Halim (2023); on the other hand, the variables Financial Innovation and Digital Literacy did not present significant effects, suggesting that these areas require further development and contextualization in future studies; digital finance showed a significant impact (coefficient of 0.173,  $p=0.001$ ), highlighting the importance of integrating digital tools into educational programs. Globalization also presented a significant coefficient of 0.125 ( $p=0.028$ ), indicating that, although its impact is moderate, it remains relevant in the formation of financial education, as previously pointed out by studies of Grabiél *et al.* (2021).

## 5. Conclusions and Further Research

The findings obtained throughout the study have allowed us to understand the perceptions and attitudes of participants regarding digital and face-to-face financial education, revealing both the strengths and weaknesses of current educational strategies.

Firstly, it has been shown that although digital financial education is seen as an important tool for economic development, its adoption faces significant obstacles, particularly in regions such as Bagua, where connectivity limitations and familiarity with digital tools negatively impact its effectiveness; this underlines the urgent need for public policies that promote technological infrastructure and access to digital education platforms, in line with the conclusions of studies such as that of Maldonado *et al.* (2023), who highlighted the importance of virtual financial education for financial inclusion.

Secondly, despite the moderate perception of digital financial education, face-to-face financial education remains the most valued approach among participants, reflecting the persistent preference for traditional teaching methods; this finding is consistent with the claims of Sconti (2022) who argue that face-to-face financial education offers more stable and durable literacy, which is relevant for areas with technological limitations; however, it is crucial to consider that a significant portion of participants also showed willingness to integrate digital methods into their learning processes, suggesting that a hybrid model could be the solution to cover the educational needs of all communities.

The analysis of the predictor variables, such as digital financial education, digital finance, digital literacy, financial innovation and globalization, has shown that these variables explain a significant proportion of the variability in face-to-face financial education; in particular, digital financial education and digital finance showed a positive and significant influence with face-to-face education, which emphasizes the importance of integrating these digital variables into educational curricula however, financial innovation and digital literacy did not present a significant influence in the model, which could indicate that these elements require further contextualization and deepening in future research.

Finally, the results suggest that financial education, both digital and in-person, plays a key role in developing fundamental economic skills; it is imperative that both governments and educational institutions restructure their approaches to incorporate both methods in a complementary way, considering the particular characteristics of each community and region; digital financial education, while essential for global economic progress, must be accompanied by inclusion strategies that guarantee equitable access for all people, regardless of their location or level of digital literacy.

This study also highlights the relevance of incorporating globalization as a component of financial education, since the effects of global integration must be understood in their local context; globalization, although not yet fully rooted in the perceptions of participants, has a potential impact on financial education and should be considered in the design of policies and teaching strategies.

### Future studies should focus on the following:

Future research	Independent variable	Intervening variables	Dependent variable	Methodology	Statistics to be used
Impact of digital financial education on face-to-face financial education	Digital financial education	Internet connectivity, attitude towards digitalization, cultural context	In-person financial education	Quantitative, experimental design, pre-post test	ANOVA, multiple regression, Student's t test
Factors affecting the acceptance of digital financial education in	Digital financial education	Access to technologies, cultural resistance,	Perception of the usefulness of digital	Quantitative, descriptive design	Regression analysis, Pearson

Future research	Independent variable	Intervening variables	Dependent variable	Methodology	Statistics to be used
rural areas		educational level	financial education	Explanatory	correlation
Evaluating the effectiveness of financial innovation programs in financial inclusion	Financial innovation	Degree of familiarity with financial innovations, access to financial services	Financial inclusion of participants	Quantitative, longitudinal design	Multivariate regression, analysis of variance (ANOVA)

Note: Prepared with information from the findings of this study.

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### Authors' contributions

**Anita Maribel Valladolid Benavides:** Conceptualization, and methodology.

**Víctor Hugo Puican Rodríguez:** software, validation and formal analysis.

**Jorge Luis Vargas Espinoza:** research and resources.

**Alex Lenin Guivin Guadalupe:** Visualization, supervision, project management and fundraising.

**Julca Maluquis, Eder:** Data curation and writing of the original draft.

**Minga Mori, Jhonmar:** Writing, revising and editing.

### Declaration of competing interests

The authors declare that they have no competing financial interests or personal relationships that could have influenced the work presented in this article.

### 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 prior to submission, but only to improve the language.

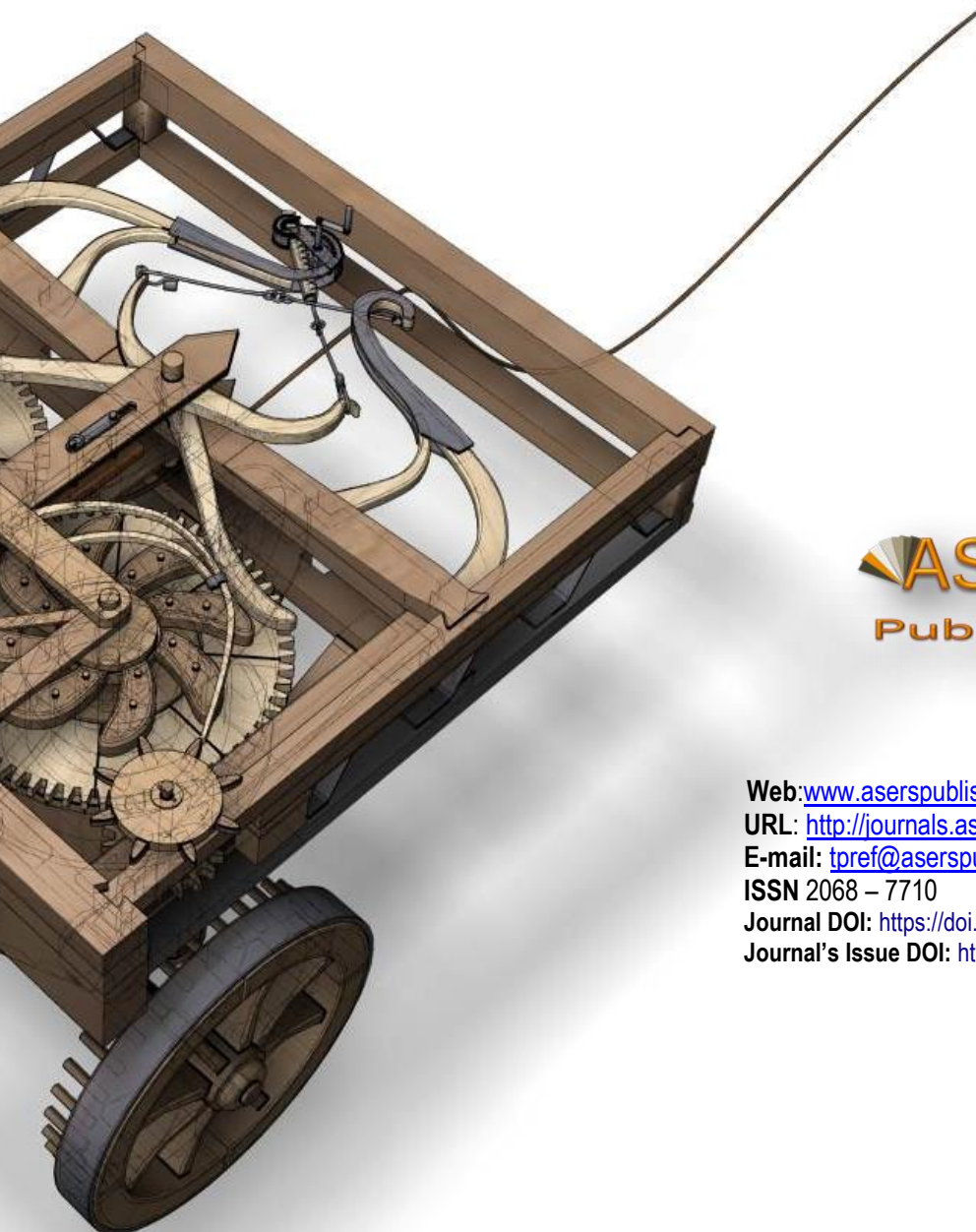
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