eCo-Fin: Economics and Financial

Vol.8, No.1, February 2026
Available online at: https://jurnal.kdi.or.id/index.php/ef

The Role of Education in Enhancing Women's Skills and Opportunities for Inclusive Sustainable Economic Development in Tangerang City

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Article history:

Received: December 5th, 2025
Revised: February 9th, 2026
Accepted: February 10th, 2026
Available online: February 10th, 2026

Keywords:

Education Level;
Human Resource Quality;
PLS-SEM;
Social Support;
Women's Empowerment;

ABSTRACT

Education plays a pivotal role in enhancing the quality of women's human resources, which are crucial for driving inclusive economic development; however, many Indonesian women still face barriers in accessing education that aligns with labor market needs. This work focuses on exploring the effects of social support, education level, and education-labor market relevance on women's human resource quality and empowerment in Tangerang City, providing insights for gender-responsive educational policies. Using a quantitative descriptive-explanatory design and the PLS-SEM approach, data were collected from 155 educated women working across formal and informal sectors. The results show that social support, education level, and educational relevance significantly influence both women's empowerment and human resource quality, with empowerment serving as a strong mediating variable ($R^2 = 0.864$). By expanding women's access to education and empowering interventions, and by ensuring assistance from familial, community, and governmental actors, the development of high-quality female human resources can be accelerated, leading to more resilient and sustainable economic outcomes within local regions.

INTRODUCTION

Education remains a key driver in promoting the improvement of women's human capital, who make a significant contribution to economic development (Antonucci et al., 2013). In Indonesia, although women possess high potential, they still face barriers in accessing quality

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EISSN. 2622-4305
PISSN. 2622-4291
Published by Komunitas Dosen Indonesia.
DOI: 10.32877/ef.v8i1.3456

education that aligns with labor market needs (Olofsson, 2009). Inequalities in access to education and job prospects remain a major obstacle to women's active contribution to economic development that is both inclusive and sustainable (BPS, 2021). In fact, higher education can equip women with skills, independence, and critical thinking abilities to participate in productive economic sectors (Aisyah, 2022). However, the quality of education received by women is often not yet optimal to address the challenges of the modern economy (Rowe & Skourdoumbis, 2019).

In the context of Tangerang City, the increasing number of highly educated women indicates significant progress. They contribute in the formal sector as lecturers, employees, and teachers, as well as in the informal sector as MSME entrepreneurs. Educated women not only contribute to their family's economy but also serve as drivers of local and community economic development. This shows that education is not merely about providing knowledge but also about shaping adaptive mindsets, leadership, and competitiveness among women in the global era (Aisyah, 2022).

This research is significant because education is a key factor in strengthening women's economic capacity and promoting inclusive economic growth. By understanding the relationship between educational attainment, human resource quality, and economic participation, The purpose of this research is to offer strategic guidance for implementing education policies that are more sensitive to gender needs while strengthening locally based initiatives that support women's empowerment (Sulisto et al., 2023). Furthermore, the findings are expected to support the realization of equitable, sustainable, and participatory economic development where women act as agents of social and economic change rather than merely beneficiaries (Wang, 2021).

Hypothesis

H1: Social Support has a positive effect on Human Resource Quality.
H2: Education Level has a positive effect on Human Resource Quality.
H3: Education Relevance has a positive effect on Human Resource Quality.
H4: Social Support has a positive effect on Women's Empowerment.
H5: Education Level has a positive effect on Women's Empowerment.
H6: Education Relevance has a positive effect on Women's Empowerment.
H7: Women's Empowerment has a positive effect on Human Resource Quality.
H8: Women's Empowerment mediates the effect of Social Support on Human Resource Quality.
H9: Women's Empowerment mediates the effect of Education Level on Human Resource Quality.
H10: Women's Empowerment mediates the effect of Education Relevance on Human Resource Quality.

This research applies a quantitative strategy using a descriptive–explanatory design to examine how educational components influence women's economic empowerment in Tangerang City. Data analysis was performed through PLS-SEM utilizing the SmartPLS software. This technique was selected as it enables the evaluation of intricate associations among latent constructs, including both direct and mediated effects, and is appropriate for studies involving a moderately sized sample (Hair et al., 2021). The use of SEM-PLS also enables simultaneous testing of exogenous and endogenous variables more efficiently and can accommodate non-normal data.

The variables examined throughout this research consist of three independent variables Social Support (X1), Education Level (X2), and Education labor Market Relevance (X3) and

two dependent variables Women's Human Resource Quality (Y) and Women's Empowerment in Economic Development (Z).

Conseptual Framework

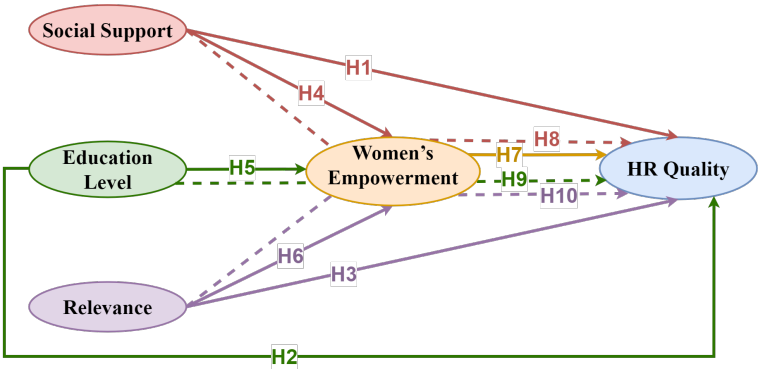


Figure 1. Conceptual Framework

This study focuses on analyzing the role of education in improving the quality of women's human resources (HR) and their economic empowerment in Tangerang City. The variables used consist of three independent variables Social Support (X1), Education Level (X2), and Education–Labor Market Relevance (X3) and two dependent variables, namely Women's Human Resource Quality (Y) and Women's Economic Empowerment in Economic Development (Z). Social support encompasses the roles of family, community, and government policies in supporting women's access to education. Education level represents the formal educational attainment, while education-labor market relevance measures the alignment between educational curricula and industry needs.

The dependent variables reflect the outcomes of education and social support processes. Women's HR quality is measured by their abilities, skills, and competitiveness in the labor market, whereas women's economic empowerment reflects financial independence, economic decision-making ability, and active participation in both formal and informal sectors. Using the PLS-SEM modeling approach, this study examines how strongly education, HR quality, and women's economic empowerment are related both directly and through mediation effects. The analysis results are expected to provide an empirical basis for formulating educational and women's empowerment policy recommendations that are more inclusive, responsive to labor market needs, and oriented toward sustainable local economic development.

RESEARCH METHOD

A quantitative approach is used in this study, supported by a descriptive explanatory research design. The design aims to examine causal relationships among social support, education level, and education–labor market relevance in influencing women's human resource quality, with women's empowerment positioned as a mediating variable. A cross-sectional framework was used, whereby all data were collected at the same moment in time. This approach is appropriate for testing structural relationships and assessing both direct and indirect effects among latent constructs within an integrated research model.

The sample size was determined based on the *rules of thumb* for PLS-SEM, which indicate that the sample does not need to be large but must be sufficient to generate stable and valid estimates (Sofyani, 2025). Hair et al. (2021) suggest that an appropriate minimum sample size for PLS-SEM should be approximately five to ten times the maximum number of indicators

associated with any single construct. In the present study, the construct containing the largest set of indicators is measured using five indicators; therefore, the minimum required sample size ranges from 25 to 50 respondents. Despite this minimum requirement, the study employed 155 respondents, consisting of highly educated women living in Tangerang City. The use of a larger sample size was intended to enhance statistical power, improve the stability of parameter estimates, and strengthen the validity and reliability of the PLS-SEM results, thereby ensuring more robust and generalizable findings.The study population includes women working in both the formal sector (lecturers, teachers, employees, or professionals) and the informal sector (MSME entrepreneurs). Respondent selection utilized purposive sampling, meaning participants were intentionally chosen based on characteristics pertinent to the research objectives.

Information was collected via a standardized questionnaire that had been designed in advance based on the indicators presented in Table 1. A five-level Likert scale was utilized for the questionnaire, where participants rated each item from 1 (strong disagreement) to 5 (strong agreement). The instrument was distributed online via Google Forms and offline through women entrepreneur communities, educational institutions, and respondents' workplaces.

Each indicator in the questionnaire represents a construct tested in the PLS-SEM model, such as social support, education level, education relevance, HR quality, and women's economic empowerment. The assessment of instrument validity involved examining both convergent and discriminant validity, whereas the reliability evaluation was conducted through Composite Reliability and AVE indicators. The findings from the analysis aim to provide empirical clarification regarding the interrelationships among the research variables and contribute to the development of policy recommendations that enhance women's education and empowerment at the local context. Data analysis was conducted using PLS-SEM. The analysis procedure included the assessment of the measurement model and the structural model. The measurement model was evaluated through convergent validity, discriminant validity, and construct reliability. The structural model was assessed using path coefficients, coefficient of determination, and significance testing through bootstrapping. Mediation analysis was performed to examine the role of women's empowerment in transmitting the effects of exogenous variables on women's human resource quality. This method was selected due to its suitability for predictive models, moderate sample sizes, and non-normal data distributions.

Operational Variables

Table 1. Operational Indicators of Variables

Variable	Dimension	Indicator
Sosial Support (X1) (Amelia & Arimbi, 2022; Larasai et al., 2022; Mulyah & Khoiri, 2023; Pakaya & Posumah, 2021; Susilawati et al., 2023)	Family Support	1. Family support in education and career
	Peer&Community Supoort	2. Role of friends and social environment in supporting education
	Government Support	3. Government policies supporting women's education
	Financial Support	4. Financial aid or scholarships for women's education
	Motivational Support	5. Motivation from communities or social organizations
Education Level (X2) (Ahmad, 2013; Asih & Anzari, 2021; Iffah & Bachtiar, 2024; Retnowati et	Formal Education	1. Level of education completed
	Academic Performance	2. Academic achievement during study
	Skill Development	3. Participation in additional training or certifications
	Educational Access	4. Access to quality education

al., 2016; Syakrani et al., 2022)	Learning Opportunities	5. Opportunities for women to pursue higher education
Relevance (X3) (Pramesti et al., 2024; Salsabila & Hermina, 2025)	Curriculum Industy Aligment	1. lignment of educational curriculum with industry needs
	Industry Engagement	2. Avaibility of Intership programsor industry education collaborations
	Skill Fit	3. Acquired skills matching job requirements
	Tecnological Adaptation	4. Ability to adapt to technological developments in the workplace
	Career Opportunities	5. Women's opportunities in high-skill occupations
HR Quality (Y) (Agouw et al., 2018; Alfiyah, 2020; Nurvita et al., 2020; Sukatma, 2024; Wardhani et al., 2024)	Competence	1. Technical and professional competence of women in the workplace
	Productivity	2. Work productivity and contribution
	Cognitive Skills	3. Critical thinking and problem-solving skills
	Adaptability	4. Adaptability to technological and environmental changes
	Career Autonomy	5. Independence in career and business development
Women's Empowerment (Z) (Abdurrahman & Tusianti, 2021; Masruchiyah & Laratmase, 2023)	Participation	1. Level of women's participation in formal and informal sectors
	Financial Independence	2. Financial independence in fulfilling life needs
	Leadership Acces	3. Opportunities for women to hold leadership positions
	Decision Making Role	4. Women's contribution to household and community economic decision making
	Economic Resources Access	5. Access to capital, training, and business opportunities

The operationalization of variables in this study covers five main constructs: Social Support (X1), reflecting the role of family, community, policies, and social networks in supporting women's education; Education Level (X2), measuring the level, achievement, training, and access to education; Education Relevance (X3), assessing curriculum and skill alignment with industry needs; Women's Human Resource Quality (Y), describing competence, productivity, and career independence; and Women's Empowerment (Z), representing participation, financial independence, leadership, and access to economic opportunities. These five variables Were implemented to evaluate the interaction between education and women's economic empowerment in Tangerang City.

Data Analysis Technique

This research applies a PLS-SEM approach to analyze the relationships within the proposed model, processed entirely using SmartPLS. This approach was selected because it enables the simultaneous examination of causal relationships among latent variables both direct and indirect even when the dataset does not meet normal distribution assumptions or the sample size is relatively moderate (Hair et al., 2021). The evaluation process consisted of two major components: first, examining the measurement model, and second, testing the structural model.

Validity and reliability checks were performed as part of the measurement model evaluation to ensure its credibility and precision. Convergent validity was confirmed when the outer loadings were greater than 0.70 and the AVE exceeded 0.50. Meanwhile, discriminant validity was established through the Fornell–Larcker approach. Additionally, reliability was

assessed using Cronbach's Alpha and CR, with both required to meet the minimum criterion of 0.70.

The next stage, the inner model, analyzed relationships among latent variables and tested the hypotheses. Multicollinearity was first tested using the VIF, with criteria VIF < 10 and Tolerance > 0.10, to ensure no high correlation among independent variables. Relationships among variables were then tested using the bootstrapping method to obtain path coefficients, T-statistics, and p-values. Hypotheses were accepted if T-statistics ≥ 1.96 or p-values ≤ 0.05 at a 5% significance level. Additionally, R-Square values were used to measure the model's explanatory power for endogenous variables, with higher R^2 values indicating stronger explanatory ability.

Thus, the use of SmartPLS allows researchers to obtain valid, reliable, and appropriate results for testing the relationships among variables in the context of women's empowerment in Tangerang City.

RESULTS AND DISCUSSION

Results

This study involved 155 respondents with diverse characteristics, all of whom were women, categorized by occupation and age. Based on the tabulation results, the number of female respondents was 155 (100%), indicating full female participation in this study. In terms of occupation, most respondents were private-sector employees, totaling 62 people (40.0%), followed by civil servants (ASN) with 31 people (20.0%), entrepreneurs with 28 people (18.1%), and lecturers/teachers with 21 people (13.5%). The remaining 13 respondents (8.4%) came from other occupational groups such as housewives, freelancers, and those currently unemployed. Based on age distribution, respondents aged 18-25 years accounted for 47 people (30.3%), those aged 26-35 years totaled 55 people (35.5%), 36-45 years were 34 people (21.9%), and respondents over 45 years old amounted to 19 people (12.3%). These data indicate that the majority of respondents were women working in the private sector and within the productive age group, particularly between 26-35 years.

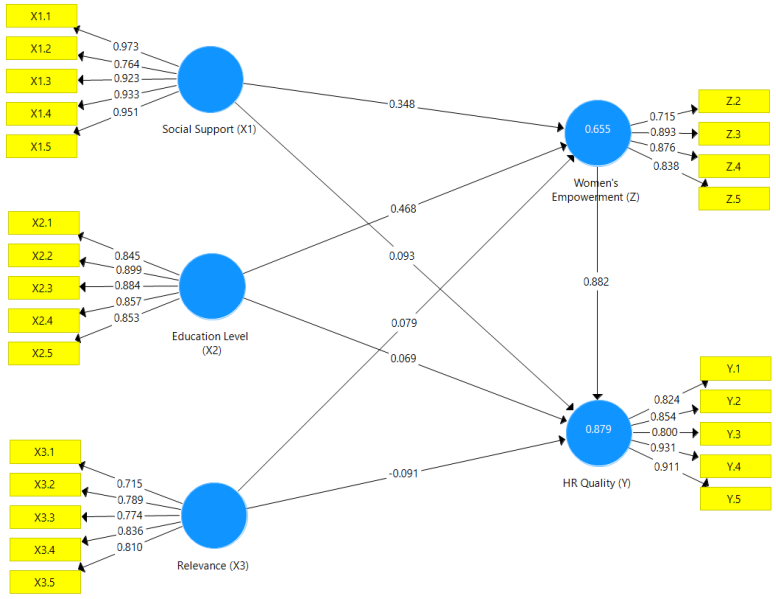
Table 2. Descriptive Statistics

Variable	Minimum	Maximum	Mean	Standard Deviation
Social Support (X1)	3	5	4,185	0,728361
Education Level (X2)	3	5	4,348	0,693208
Relevance (X3)	3	5	4,360	0,667209
Women Empowerment (Z)	3	5	4,213	0,711543
HR Quality (Y)	3	5	4,472	0,636075

Source: Data Analysis Process, 2025

The outcomes obtained from the descriptive analysis highlight that the lowest scores across all variables fall within the range of 1 to 2, whereas the highest scores consistently reach a value of 5, indicating that respondents' answers varied across the full scale from lowest to highest. The mean values suggest that responses tend to be moderately high. The social support variable has an average of 3.043 with a standard deviation of 0.770, suggesting that respondents' perception of social support falls within the medium category with moderate variation. The education level variable averages 3.743 (SD = 0.911), indicating that respondents generally have a fairly good educational background. The relevance variable has a mean of 3.788 (SD = 0.929),

implying that respondents rated the relevance of the programs or research context as high. Women empowerment averages 3.578 (SD = 0.944), meaning empowerment is perceived as fairly good though with some variation in views. The human resource quality variable shows a mean of 3.770 (SD = 0.861), indicating relatively high and consistent perceived HR quality compared to other variables.



Source: Data Analysis Process, 2025

Figure 1. Outer Model

The outer loading test results indicate that all indicators for each variable have loading factor values between 0.18 and 0.31. This suggests that each indicator contributes to reflecting its respective latent construct, although the degree of contribution varies.

For Social Support (X1), indicators X1.1-X1.5 show loadings between 0.207 and 0.231, meaning each indicator adequately reflects the construct despite moderate contributions. For Education Level (X2), indicators X2.1-X2.5 have loadings between 0.218 and 0.256, showing consistent contributions. The Relevance (X3) variable has five indicators with loadings ranging from 0.240 to 0.281, indicating good contribution. The Human Resource Quality (Y) variable is measured through five indicators with loadings between 0.210 and 0.251, showing sufficient representativeness. The Women Empowerment (Z) variable has more varied loading values (0.182–0.315), with Z.3 being the most dominant (0.315) and Z.1 the weakest (0.182). Overall, all indicators are acceptable for the model despite some having lower contributions.

Table 3. Outer Loadings

	Social Support (X1)	Education Level (X2)	Relevance (X3)	HR Quality (Y)	Women Empowerment (Z)
X1.1	0,973				
X1.2	0,764				
X1.3	0,923				
X1.4	0,933				
X1.5	0,951				
X2.1		0,845			
X2.2		0,899			

X2.3	0,884			
X2.4	0,857			
X2.5	0,853			
X3.1		0,715		
X3.2		0,789		
X3.3		0,774		
X3.4		0,836		
X3.5		0,810		
Y.1			0,824	
Y.2			0,854	
Y.3			0,800	
Y.4			0,931	
Y.5			0,911	
Z.2				0,715
Z.3				0,893
Z.4				0,876
Z.5				0,838

Source: Data Analysis Process, 2025

Referring to the findings shown in Table 3, all retained indicators exhibit acceptable outer loading values above the recommended cutoff of 0.70, indicating that each construct achieves sufficient convergent validity within the measurement model. For the Social Support (X1) construct, indicators X1.1 to X1.5 exhibit very high outer loading values ranging from 0.764 to 0.973. These results indicate that all indicators strongly represent the Social Support construct, with X1.1 emerging as the most dominant indicator. The Education Level (X2) construct also shows strong and consistent indicator loadings, with values between 0.845 and 0.899. This suggests that all indicators contribute substantially and relatively evenly to measuring the Education Level construct. Regarding the Relevance (X3) construct, indicators X3.1 to X3.5 present outer loading values ranging from 0.715 to 0.836. Although some variation is observed among indicators, all values exceed the acceptable threshold, confirming that the indicators adequately reflect the Relevance construct. The Human Resource Quality (Y) construct demonstrates high outer loading values between 0.800 and 0.931, indicating excellent indicator reliability. Indicators Y.4 and Y.5 show particularly strong contributions, highlighting their dominant role in representing the Human Resource Quality construct. For the Women Empowerment (Z) construct, indicators Z.2 to Z.5 display outer loading values ranging from 0.715 to 0.893, confirming their adequacy in measuring the construct. However, indicator Z.1 records an outer loading value of 0.595, which falls below the recommended threshold of 0.70. Consequently, indicator Z.1 was removed from the model to ensure the robustness and validity of the measurement model.

Table 4. Average Variance Extracted

	Cronbach's Alpha	**rho_A**	**Composite Reliability**	**AVE**
Social Support (X1)	0,947	0,950	0,961	0,831
Education Level (X2)	0,918	0,921	0,939	0,753
Relevance (X3)	0,845	0,847	0,890	0,618
HR Quality (Y)	0,915	0,920	0,937	0,749
Women's Empowerment (Z)	0,852	0,872	0,900	0,695

Source: Data Analysis Process, 2025

able 4 provides an overview of the reliability analysis and convergent validity results for the latent constructs included in the measurement model. The evaluation was conducted using

Cronbach's Alpha, rho_A, Composite Reliability, and AVE. The results indicate that all constructs demonstrate strong internal consistency reliability, as reflected by Cronbach's Alpha values ranging from 0.845 to 0.947, exceeding the recommended minimum threshold of 0.70. Similarly, the rho_A values, which range from 0.847 to 0.950, further confirm the stability and consistency of the constructs. Composite Reliability values for all constructs fall between 0.890 and 0.961, indicating a high level of construct reliability and suggesting that the indicators consistently measure their respective latent variables.

In terms of convergent validity, the AVE values for all constructs exceed the recommended threshold of 0.50, ranging from 0.618 to 0.831. This indicates that each construct explains more than 50% of the variance of its indicators, thereby confirming adequate convergent validity. The Social Support (X1) construct demonstrates the highest AVE value, indicating the strongest explanatory power among the constructs.

Table 5. Discriminant Validity

	Education Level (X2)	**HR Quality (Y)**	**Relevance (X3)**	**Social Support (X1)**	**Women's Empowerment (Z)**
Education Level (X2)	0.868				
HR Quality (Y)	0,720	0,865			
Relevance (X3)	0,859	0,655	0,786		
Social Support (X1)	0.644	0.696	0.659	0.912	
Women's Empowerment (Z)	0,759	0,935	0,710	0,701	0,834

Source: Data Analysis Process, 2025

Table 5 presents the discriminant validity assessment using the Fornell–Larcker criterion. The results show that the square roots of the AVE for all constructs are higher than their inter-construct correlations. This condition is observed for Social Support (X1), Education Level (X2), Relevance (X3), Human Resource Quality (Y), and Women's Empowerment (Z), indicating that the measurement model satisfies the discriminant validity requirements.

Table 6. Model Fit

	Saturated Model	**Estimated Model**
SRMR	0,077	0,077
d_ULS	1,791	1,791
d_G	2,482	2,482
Chi-Square	1531,464	1531,464
NFI	0,680	0,680

Source: Data Analysis Process, 2025

Table 6 displays the goodness-of-fit indices for both the Saturated and Estimated models. The results show identical values across both models, indicating consistency between the measurement model and the structural model specification. The SRMR value for both models is 0.077, which is below the recommended threshold of 0.08. This suggests that the overall discrepancy between the observed correlations and the model-implied correlations is within an acceptable range, indicating a good model fit.

The d_ULS value of 1.791 and the d_G value of 2.482 further support the adequacy of the model, as these indices indicate that the difference between the empirical covariance matrix and the model-implied covariance matrix remains at an acceptable level. The Chi-Square value for both models is 1531.464. In the context of PLS-SEM, this statistic is not used as a primary

criterion for model evaluation, as it is highly sensitive to sample size. Therefore, the interpretation of model fit relies more heavily on alternative indices such as SRMR. The NFI value of 0.680 indicates a moderate level of model fit. Although this value does not reach the conventional cutoff of 0.90 commonly applied in covariance-based SEM, it is still considered acceptable within the PLS-SEM framework, particularly for exploratory or prediction-oriented research.

Table 7. Coefficient of Determination (R^2)

	R Square	R Square Adjusted
HR Quality Y	0,864	0,860
Women's Empowerment Z	0,690	0,684

Source: Data Analysis Process, 2025

The R^2 analysis indicates that the Human Resource Quality (Y) construct obtained an R^2 of 0.864 with an Adjusted R Square of 0.860. This reflects that approximately 86.4% of the variance in human resource quality is accounted for by the predictors social support, education level, educational relevance, and women's empowerment while the remaining 13.6% is attributed to other factors beyond the scope of this study. Furthermore, the women's empowerment (Z) demonstrates an R^2 value of 0.690 and an Adjusted R Square of 0.684, signifying that 69.0% of its variance is explained by social support, education level, and educational relevance, whereas 31.0% is influenced by external variables not incorporated in the model. These findings suggest that the proposed model possesses substantial explanatory capability, particularly regarding the human resource quality variable, which exhibits an R^2 value approaching 1.

Table 8. Q Square

Variable	SSO	SSE	Q^2 (=1-SSE/SSO)
Education Level (X2)	775.000	775.000	
HR Quality (Y)	775.000	273.666	0.647
Relevance (X3)	775.000	775.000	
Social Support (X1)	775.000	775.000	
Women's Empowerment (Z)	620.000	344.197	0.445

Source: Data Analysis Process, 2025

As shown in Table 8, the endogenous construct HR Quality (Y) has a Q^2 value of 0.647, indicating strong predictive relevance of the model for this variable. Similarly, Women's Empowerment (Z) exhibits a Q^2 value of 0.445, which also reflects substantial predictive relevance. These results suggest that the exogenous constructs in the model are able to accurately predict both HR Quality and Women's Empowerment. In contrast, the constructs Education Level (X2), Relevance (X3), and Social Support (X1) show Q^2 values of zero, as their SSO and SSE values are identical. This result is expected because these variables function as exogenous constructs in the model and are not predicted by other variables.

Table 9. f Square

Variable	Education Level (X2)	HR Quality (Y)	Relevance (X3)	Social Support (X1)	Women's Empowerment (Z)
Education Level (X2)		**0,009**			**0,159**
HR Quality (Y)					
Relevance (X3)		**0,017**			**0,004**
Social Support (X1)		0,033			**0,191**
Women's Empowerment (Z)		**2,217**			

Source: Data Analysis Process, 2025

The results show that Women's Empowerment (Z) has a very large effect on Human Resource Quality (Y), with an f^2 value of 2.217. This indicates that Women's Empowerment plays a dominant and critical role in explaining variations in HR Quality, and its exclusion from the model would lead to a substantial decrease in the explanatory power of the endogenous construct. Social Support (X1) demonstrates a medium effect on Women's Empowerment (Z), with an f^2 value of 0.191, suggesting that Social Support meaningfully contributes to enhancing Women's Empowerment. Additionally, Social Support exhibits a small effect on HR Quality (Y), as reflected by an f^2 value of 0.033, indicating a limited but still present contribution.

The Education Level (X2) construct shows a medium effect on Women's Empowerment (Z), with an f^2 value of 0.159, highlighting its importance in influencing Women's Empowerment. However, its effect on HR Quality (Y) is negligible, with an f^2 value of 0.009, indicating a minimal contribution. Similarly, Relevance (X3) displays very small effects on both HR Quality (Y) and Women's Empowerment (Z), with f^2 values of 0.017 and 0.004, respectively. These values suggest that while Relevance has a statistically observable influence, its practical impact on the endogenous constructs is limited.

Table 10. Path Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Education Level (X2) -> HR Quality (Y)	0,069	0,066	0,072	0,952	**0,171**
Education Level (X2) -> Women's Empowerment (Z)	0,468	0,461	0,133	3,503	**0,000**
Relevance (X3) -> HR Quality (Y)	-0,091	-0,083	0,061	1,490	**0,068**
Relevance (X3) -> Women's Empowerment (Z)	0,079	0,088	0,113	0,695	**0,244**
Social Support (X1) -> HR Quality (Y)	0,093	0,094	0,039	2,380	**0,009**
Social Support (X1) -> Women's Empowerment (Z)	0,348	0,347	0,066	5,304	**0,000**
Women's Empowerment (Z) -> HR Quality (Y)	0,882	0,876	0,049	18,040	**0,000**

Source: Data Analysis Process, 2025

The relationship between Education Level (X2) and Human Resource Quality (Y) shows a positive but statistically insignificant effect, with a path coefficient of 0.069, a t-value of 0.952,

and a p-value of 0.171. This indicates that Education Level does not have a significant direct influence on HR Quality. In contrast, Education Level (X2) has a positive and statistically significant effect on Women's Empowerment (Z), as indicated by a path coefficient of 0.468, a t-value of 3.503, and a p-value of 0.000. This finding suggests that higher education levels play an important role in strengthening women's empowerment. The relationship between Relevance (X3) and Human Resource Quality (Y) shows a negative but statistically insignificant effect, with a path coefficient of -0.091, a t-value of 1.490, and a p-value of 0.068. This result indicates that Relevance does not directly contribute to improving HR Quality. Similarly, the effect of Relevance (X3) on Women's Empowerment (Z) is positive but not significant, as reflected by a path coefficient of 0.079, a t-value of 0.695, and a p-value of 0.244. For Social Support (X1), the results demonstrate a positive and statistically significant direct effect on Human Resource Quality (Y), with a path coefficient of 0.093, a t-value of 2.380, and a p-value of 0.009. This indicates that increased social support contributes to improvements in HR Quality. Moreover, Social Support (X1) has a strong and statistically significant effect on Women's Empowerment (Z), with a path coefficient of 0.348, a t-value of 5.304, and a p-value of 0.000, highlighting the importance of social support in fostering women's empowerment. Finally, Women's Empowerment (Z) exhibits a very strong positive and statistically significant effect on Human Resource Quality (Y), with a path coefficient of 0.882, a t-value of 18.040, and a p-value of 0.000. This relationship represents the strongest effect in the model, emphasizing that women's empowerment is a key determinant of human resource quality.

Table 11. Total Indirect Effects

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Education Level (X2) -> HR Quality (Y)	0,412	0,403	0,116	3,554	**0,000**
Education Level (X2) -> Women's Empowerment (Z)					
Relevance (X3) -> HR Quality (Y)	0,069	0,077	0,099	0,699	**0,243**
Relevance (X3) -> Women's Empowerment (Z)					
Social Support (X1) -> HR Quality (Y)	0,307	0,305	0,062	4,927	**0,000**
Social Support (X1) -> Women's Empowerment (Z)		0,000	0,000		
Women's Empowerment (Z) -> HR Quality (Y)					

Source: Data Analysis Process, 2025

The results indicate that Education Level (X2) has a positive and statistically significant indirect effect on Human Resource Quality (Y), with an indirect effect value of 0.412, a t-statistic of 3.554, and a p-value of 0.000. This finding suggests that although Education Level does not have a significant direct effect on HR Quality, it significantly improves HR Quality indirectly through Women's Empowerment, highlighting the important mediating role of empowerment in this relationship.

In contrast, the indirect effect of Relevance (X3) on Human Resource Quality (Y) is positive but not statistically significant, as indicated by an indirect effect value of 0.069, a t-

statistic of 0.699, and a p-value of 0.243. This result implies that Relevance does not significantly influence HR Quality through Women's Empowerment. Furthermore, Social Support (X1) shows a strong and statistically significant indirect effect on Human Resource Quality (Y), with an indirect effect coefficient of 0.307, a t-statistic of 4.927, and a p-value of 0.000. This finding indicates that Social Support enhances HR Quality through its positive influence on Women's Empowerment, reinforcing the mediating function of empowerment in the model. No indirect effects are reported for paths leading directly to Women's Empowerment (Z), as it functions as the mediating variable rather than an outcome variable in the indirect effect analysis.

Table 12. Specific Indirect Effects

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Education Level (X2) -> Women's Empowerment (Z) -> HR Quality (Y)	0,412	0,403	0,116	3,554	**0,000**
Relevance (X3) -> Women's Empowerment (Z) -> HR Quality (Y)	0,069	0,077	0,099	0,699	**0,243**
Social Support (X1) -> Women's Empowerment (Z) -> HR Quality (Y)	0,307	0,305	0,062	4,927	**0,000**

Source: Data Analysis Process, 2025

The results indicate that Education Level (X2) has a positive and statistically significant indirect effect on Human Resource Quality (Y) through Women's Empowerment (Z). This is evidenced by an indirect effect coefficient of 0.412, a t-statistic of 3.554, and a p-value of 0.000. These findings suggest that improvements in education level enhance HR Quality primarily by strengthening women's empowerment, confirming the presence of a significant mediating effect.

In contrast, the indirect effect of Relevance (X3) on Human Resource Quality (Y) through Women's Empowerment (Z) is positive but not statistically significant, with an indirect effect value of 0.069, a t-statistic of 0.699, and a p-value of 0.243. This indicates that Women's Empowerment does not significantly mediate the relationship between Relevance and HR Quality.

Furthermore, Social Support (X1) exhibits a strong and statistically significant indirect effect on Human Resource Quality (Y) via Women's Empowerment (Z), as reflected by an indirect effect coefficient of 0.307, a t-statistic of 4.927, and a p-value of 0.000. This result highlights the critical role of social support in improving HR Quality through its positive influence on women's empowerment.

Discussion

The Effect of Social Support on Human Resource Quality

The results indicate that social support has a positive and significant effect on human resource quality. This relationship suggests that when women receive adequate social support from family, colleagues, and the surrounding community, they are more likely to experience increased motivation, emotional stability, and confidence. These conditions encourage women to engage more actively in their work and personal development, which ultimately improves the quality of their human resources. Social support also helps reduce psychological barriers and

stress, enabling women to focus on improving their skills and performance. However, the relatively small magnitude of the effect indicates that social support alone is not sufficient to substantially enhance HR quality without the presence of other reinforcing factors.

The Effect of Education Level on Human Resource Quality
Education level does not show a significant direct effect on human resource quality. This finding indicates that formal education alone does not automatically result in better HR outcomes. Although education provides knowledge and technical competence, its benefits may not be fully realized if women lack opportunities, authority, or confidence to apply what they have learned. In this context, education functions as a potential resource rather than a direct driver of HR quality. This suggests that education needs to be accompanied by enabling mechanisms such as empowerment to translate educational attainment into tangible improvements in performance and productivity.

The Effect of Relevance on Human Resource Quality
The results show that relevance does not significantly influence human resource quality. This implies that even if programs, roles, or activities are perceived as relevant, they do not necessarily lead to better HR outcomes. Relevance alone may increase awareness or interest, but without empowerment or supportive conditions, it does not produce meaningful behavioral change. In this study, relevance appears to have a limited role in directly shaping HR quality, particularly when stronger factors such as empowerment and social support are present in the model.

The Effect of Social Support on Women's Empowerment
Social support has a strong and significant effect on women's empowerment. This finding highlights the importance of social environments in shaping women's autonomy and agency. Supportive relationships provide encouragement, recognition, and a sense of belonging, which strengthen women's confidence and willingness to participate actively in decision-making processes. When women feel supported, they are more likely to assert their capabilities, take initiative, and engage in productive activities, leading to higher levels of empowerment.

The Effect of Education Level on Women's Empowerment
Education level significantly enhances women's empowerment. This relationship indicates that education plays a crucial role in increasing women's knowledge, critical thinking abilities, and awareness of opportunities. Through education, women gain the cognitive and psychological resources necessary to make informed decisions and participate more actively in social and professional spheres. As a result, education serves as a foundational element that strengthens women's empowerment, enabling them to exercise greater control over their roles and responsibilities.

The Effect of Relevance on Women's Empowerment
The effect of relevance on women's empowerment is positive but not statistically significant. This suggests that relevance alone does not substantially increase empowerment. While relevance may create contextual alignment or perceived usefulness, it does not necessarily enhance autonomy or decision-making power. Empowerment requires both internal capacity,

such as education, and external reinforcement, such as social support. Without these elements, relevance remains insufficient to meaningfully strengthen women's empowerment.

The Effect of Women's Empowerment on Human Resource Quality

Women's empowerment has a very strong and significant effect on human resource quality, making it the most influential relationship in the model. This result indicates that empowered women are better able to utilize their skills, knowledge, and resources effectively. Empowerment enhances confidence, initiative, and accountability, which directly contribute to improved performance and productivity. This finding emphasizes that empowerment is a critical mechanism through which individual and contextual factors are transformed into high-quality human resources.

The Effect of Social Support on Human Resource Quality through Women's Empowerment

Social support has a significant indirect effect on human resource quality through women's empowerment. This indicates that part of the impact of social support operates by strengthening empowerment, which then improves HR quality. Supportive environments foster confidence and autonomy, enabling women to convert social encouragement into effective performance. Since the direct effect of social support on HR quality is also significant, women's empowerment acts as a partial mediator in this relationship.

The Effect of Education Level on Human Resource Quality through Women's Empowerment

Education level significantly influences human resource quality through women's empowerment. Although education does not directly affect HR quality, it indirectly improves HR outcomes by increasing empowerment. This finding demonstrates that education enhances women's capacity, while empowerment enables them to apply that capacity productively. The absence of a significant direct effect combined with a significant indirect effect indicates full mediation, confirming that empowerment is the key pathway through which education contributes to HR quality.

The Effect of Relevance on Human Resource Quality through Women's Empowerment

Relevance does not have a significant indirect effect on human resource quality through women's empowerment. This result indicates that relevance does not meaningfully strengthen empowerment and therefore cannot improve HR quality through this mechanism. The finding reinforces the conclusion that relevance plays a limited role in both direct and mediated relationships within the model, particularly when compared to education and social support.

CONCLUSION

This study confirms that all proposed hypotheses are significant, indicating that social support, education level, and educational relevance play essential roles in enhancing human resource quality and women's empowerment in Tangerang City. Social support positively influences both human resource quality and empowerment, although its direct effect on human resource quality is relatively modest. Education level also contributes positively to both outcomes, while educational relevance shows a positive effect on women's empowerment but a

negative direct impact on human resource quality, suggesting the presence of a mediating role through empowerment. Women's empowerment emerges as the most dominant factor in improving human resource quality, as reflected in the high R^2 value. Therefore, it can be concluded that strengthening women's empowerment is a more effective pathway for improving human resource quality than relying solely on structural or educational inputs.

RECOMMENDATIONS

In light of the results obtained, the study suggests that governmental bodies, educational institutions, and workforce development agencies intensify efforts to integrate women's empowerment initiatives into broader human resource development strategies. Relevant actions may include expanding access to education aligned with labor market demands, ensuring sustained social support from families and communities, and formulating policies that encourage women's participation in both formal and informal economic sectors. Nevertheless, this research has certain limitations. The primary limitation is its exclusive focus on Tangerang City, which constrains the generalizability of the findings to other regions that may differ in socio-economic characteristics and contextual factors. Second, the cross-sectional PLS-SEM approach used in this research does not capture temporal or dynamic changes in relationships among variables. Future studies are encouraged to expand the geographical coverage, employ longitudinal designs, and incorporate additional variables such as intrinsic motivation, leadership, or organizational policies to better understand the multidimensional factors influencing women's human resource development.

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