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DIMENSIONS OF WOMEN EMPOWERMENT AND HUMAN CAPITAL DEVELOPMENT IN RIVERS AND DELTA STATES, NIGERIA'S NIGER DELTA

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ABSTRACT

Women empowerment has increasingly been recognized as a critical determinant of human capital development and sustainable growth in developing economies. Despite the natural resource wealth of Rivers and Delta States in Nigeria's Niger Delta region, women in these areas continue to encounter substantial barriers to education, economic participation, and involvement in decision making, with implications for regional human capital outcomes. Anchored on Human Capital Theory (Schultz, 1961; Becker, 1964), this study examines the relationship between women empowerment and human capital development in the two states, testing a combined multidimensional measure of empowerment against its individual economic and educational components. A descriptive survey design was adopted, with data gathered from 658 respondents using structured questionnaires and analyzed through descriptive statistics and the chi square test of independence. Findings show that women empowerment, considered as a combined construct spanning economic, educational, social, and political dimensions, has a statistically significant relationship with human capital development. However, when tested independently, neither women's access to education nor their economic empowerment produced a statistically significant relationship with human capital development, despite favorable descriptive perceptions of both. No statistically significant difference was found between Rivers and Delta States. The study concludes that isolated empowerment interventions are insufficient on their own and that a coordinated, multidimensional approach is required for measurable human capital gains, and recommends integrated policy frameworks combining economic inclusion, educational access, and expanded participation in social and political life.

Keywords: *Women empowerment, Human capital development, Economic empowerment, Educational empowerment, Niger Delta, Sustainable development.*

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Introduction

Women empowerment has become a central concern in global development discourse, largely because of its demonstrated influence on human capital development. Human capital development refers to the improvement of individuals' knowledge, skills, health, and productive capabilities, and it remains a key determinant of both individual welfare and national economic performance (Becker, 1964). Within this understanding, women are increasingly recognized not merely as recipients of development interventions but as active agents whose empowerment shapes broader development outcomes. Kabeer (1999) conceptualizes women empowerment as the expansion of people's capacity to make strategic life choices in contexts where that capacity was previously denied, a definition that situates empowerment as both a process and an outcome.

International institutions have reinforced this understanding. The United Nations and the World Bank have identified women's empowerment as essential to sustainable development, a position embedded in Sustainable Development Goal 4 on quality education and Goal 5 on gender equality. Evidence from the United Nations Development Programme (2020) suggests that societies which invest in women's education and economic participation tend to record higher productivity and stronger human capital outcomes. Yet in much of the developing world, gender inequality remains entrenched. The World Bank (2019) has observed that persistent gaps in women's labor force participation reduce national income and slow the accumulation of human capital, a pattern that recurs across sub Saharan Africa despite the region's heavy reliance on women's labor in agriculture, informal trade, and household management.

Nigeria reflects this broader pattern, with regional variation in severity. Structural barriers rooted in limited access to formal employment and underrepresentation in leadership positions continues to constrain women's contribution to national human capital development (World Bank, 2019). The Niger Delta region, and Rivers and Delta States in particular, presents a striking version of this paradox. Both states are endowed with substantial natural resource wealth, yet they continue to experience high unemployment, environmental degradation, and poverty, conditions that fall disproportionately on women.

Ajakaiye and Olomola (2015) document that women in these states are heavily engaged in informal economic activity, including petty trading, farming, and small scale entrepreneurship, but their productivity is constrained by limited access to credit, education, and institutional support.

The theoretical significance of this relationship is well established. Sen (1999) argues that development should be evaluated by the expansion of human capabilities rather than by income alone, implying that the exclusion of women from education, health, and economic opportunity constrains development at a societal level, not merely an individual one. Applied to Rivers and Delta States, this reasoning suggests that women's empowerment across multiple dimensions, economic, educational, social, and political, may carry cumulative consequences for regional human capital outcomes that have not been adequately captured in existing scholarship.

Despite a substantial body of empirical work on women empowerment in Nigeria, region specific evidence for Rivers and Delta States remains limited, and existing studies have tended to examine empowerment dimensions in isolation rather than assessing their combined effect on human capital development. This gap matters because policy interventions designed around a single dimension of empowerment, for instance economic inclusion alone, may understate the developmental returns achievable through a coordinated, multidimensional approach. This study addresses that gap by examining the individual and combined effects of economic, educational, social, and political empowerment on human capital development in Rivers and Delta States, drawing on Human Capital Theory as its guiding framework.

Theoretical Framework and Literature Review

This study is anchored on Human Capital Theory, a framework most closely associated with the work of Schultz (1961) and later extended by Becker (1964). Schultz argued that expenditure on education, training, and health should be treated as investment rather than consumption, since such expenditure raises an individual's productive capacity in much the same way that investment in physical capital raises output. Becker built on this position by demonstrating that education and training expand both an individual's earning potential and their broader economic contribution,

effectively linking human capital accumulation to labor market outcomes.

A central assumption of the theory is that individuals and societies invest in human capital because they expect a return, whether in the form of higher income, improved employment prospects, or greater social mobility. Lucas (1988) later extended this reasoning into the domain of economic growth theory, arguing that the accumulation of knowledge across a population sustains long run economic expansion.

Applied to women empowerment, Human Capital Theory offers a coherent explanation for why investment in women's education and skills acquisition should be expected to improve development outcomes beyond the individual level. Women who gain access to education and training are better positioned to participate in the labor market and contribute to household and national income, and educated women are more likely to invest in the education and health of their own children, producing intergenerational returns to human capital (Schultz, 1995). This logic underlies the present study's expectation that the economic, educational, social, and political dimensions of women empowerment each contribute to human capital development in Rivers and Delta States, and that their combined effect may exceed what any single dimension produces on its own.

The empirical literature broadly supports the theoretical link between women's education and human capital outcomes. Schultz (2002) found that investment in female education yields substantial economic returns, including higher productivity, reduced fertility, and improved child health, while King and Hill (1993) reported that educated women are more likely to invest in their children's welfare, generating durable intergenerational benefits. In a cross country analysis, Abu Ghaida and Klasen (2004) found that gender gaps in education have significant negative effects on economic growth and human capital accumulation, showing that countries which underinvest in female education experience lower productivity and slower development, with gender inequality in education reducing a society's average level of human capital and, in turn, constraining its economic performance. Within Nigeria specifically, Osili and Long (2008) linked greater access to female education with lower fertility and improved child health, and Ejumudo (2013) documented how socio-cultural constraints, including early marriage and gender discrimination, continue to

restrict women's educational access and, by extension, their empowerment.

Economic participation forms a second well established strand of this literature. Duflo (2012) found that expanding women's access to economic resources improves household decision making and increases investment in children's education and health, concluding that women's empowerment and economic development function as mutually reinforcing processes rather than a simple cause and effect relationship. Klasen and Lamanna (2009) reached a similar conclusion through cross country analysis, showing that gender inequality in employment constrains economic growth by limiting the productive use of available human resources. Within the African context, Anyanwu (2014) found that women's labor force participation contributes positively to growth once barriers to employment and resource access are reduced, while Ellis, Cutura, Dione, and Gillson (2007) observed that women's substantial contribution to agriculture and informal trade across Sub Saharan Africa remains constrained by limited access to credit, land, and institutional support. In Nigeria, Akanbi (2015) found that women's economic participation raises household income and welfare, though structural barriers, including limited access to finance and weak policy implementation, continue to restrict the full realization of this potential.

Beyond the economic and educational strands, a smaller body of literature addresses the social and political dimensions of women's empowerment. Malhotra, Schuler, and Boender (2002) argue that empowerment operates across interlocking domains, including household bargaining power, community standing, and formal political participation, and that treating these domains separately understates their cumulative developmental effect. In the Nigerian context, Ejumudo (2013) similarly observes that women's limited representation in community and institutional decision-making compounds the effects of restricted access to education and income, since decisions governing resource allocation, land use, and social service provision are made without adequate input from the population most affected by them. Gender and Development theory, as articulated by Moser (1993), extends this reasoning by treating empowerment not as the accumulation of individual resources but as a shift in the underlying social relations that determine who has access to those resources in the first place.

This body of work supports the expectation, tested in the present study, that social and political inclusion may condition the extent to which economic and educational empowerment convert into measurable human capital gains.

Beyond the economic literature, the capability approach developed by Sen (1999) provides a complementary theoretical lens by framing development as the expansion of human freedoms and capabilities rather than income alone. This framing implies that excluding women from education, health, and economic opportunity constrains development at a societal level, not merely an individual one. Kabeer (1999) extends this reasoning from a feminist standpoint, positioning education and resource access as instruments that expand women's agency and their capacity for strategic decision making.

Despite this substantial body of work, three gaps remain evident. First, much of the existing literature relies on cross country or national level analysis, which tends to obscure regional variation and offers limited insight into localized contexts such as the Niger Delta. Second, empirical research focused specifically on Rivers and Delta States as distinct units of analysis remains scarce, notwithstanding the states' particular dependence on oil resources, exposure to environmental degradation, and distinctive socio-cultural structures, all of which may alter the relationship between women empowerment and human capital development relative to national trends. Third, existing studies tend to examine empowerment dimensions in isolation, typically focusing on either education or economic participation, without adequately assessing their combined or interactive effects. This study addresses these gaps by examining the economic, educational, social, and political dimensions of women empowerment together, within the specific context of Rivers and Delta States.

Methodology

This study adopted a descriptive survey research design, appropriate for systematically collecting data on women empowerment and human capital development without manipulating any variables. A cross sectional approach was used, with data collected from respondents at a single point in time. The study was conducted in Rivers and Delta States, located in Nigeria's South South geopolitical zone and forming part of the Niger Delta. These states were selected because they combine substantial natural resource wealth with

persistent socio-economic challenges, including unemployment, environmental degradation from oil exploration, and constrained access to education and productive resources, conditions that affect women disproportionately. This combination offers a distinctive setting for examining how empowerment and human capital development interact, one that national level studies tend to obscure.

The study population comprised residents of Rivers and Delta States, with women as the primary unit of analysis and a smaller proportion of male respondents included for additional perspective. Based on population estimates from the National Bureau of Statistics (2023) and the National Population Commission (2023), and the proportion of women in Nigeria's population reported by the World Bank (2023), the estimated female population across both states was approximately 7,245,315. A sample size of 400 was derived using the Yamane (1967) formula at a 0.05 precision level and increased to 700 respondents to improve reliability given the population's heterogeneity and geographic spread. A multi stage sampling technique was applied, with the study area stratified by state, Local Government Areas purposively selected, and respondents drawn through a combination of simple random and purposive sampling.

Primary data were collected through structured questionnaires administered across the selected areas, while secondary data were drawn from peer reviewed journal articles, government publications, and reports from the National Bureau of Statistics, the World Bank, and relevant United Nations agencies. Quantitative data were analyzed using descriptive statistics, including frequencies, percentages, and mean scores, to summarize respondents' demographic characteristics and their responses on education, economic participation, decision making power, and human capital outcomes. Composite indices were constructed from relevant Likert scale items and converted into categorical variables for inferential analysis. The chi square test of independence was employed to test the study's hypotheses. Informed consent was obtained from all participants, who were briefed on the study's purpose and their right to withdraw at any stage. Anonymity and confidentiality were maintained, and all secondary sources were acknowledged in accordance with APA 7th edition referencing conventions.

Table 1: Respondents' Perception of Women's Economic Empowerment and Human Capital Development (N = 658)

S/N	Statement	SA	A	D	SD	Mean	Decision
1	Women's access to financial resources improves their economic independence.	245 (37.2%)	272 (41.3%)	89 (13.5%)	52 (7.9%)	3.08	Agree
2	Economic empowerment increases household productivity and welfare.	236 (35.9%)	278 (42.2%)	93 (14.1%)	51 (7.8%)	3.06	Agree
3	Women's income-generating activities contribute to community development.	221 (33.6%)	284 (43.2%)	98 (14.9%)	55 (8.4%)	3.02	Agree
4	Lack of sustained economic opportunities limits women's productivity.	258 (39.2%)	249 (37.8%)	97 (14.7%)	54 (8.2%)	3.08	Agree

Grand Mean = 3.06 (Agree)

Table 1 indicates that the majority of respondents either strongly agreed or agreed that women's economic empowerment enhances economic independence, improves household productivity, contributes to community development, and that inadequate economic opportunities limit women's productivity. The grand mean of 3.06 indicates an overall agreement with these statements. This suggests that respondents perceive economic empowerment as an important contributor to human capital development. However, despite these positive perceptions, the later hypothesis test revealed that economic empowerment alone did not have a statistically significant relationship with human capital development.

Table 2: Respondents' Perception of Women's Educational Empowerment and Human Capital Development (N = 658)

S/N	Statement	SA	A	D	SD	Mean	Decision
1	Education improves women's employability.	252 (38.3%)	266 (40.4%)	88 (13.4%)	52 (7.9%)	3.09	Agree
2	Education enhances women's skills and productivity.	239 (36.3%)	276 (41.9%)	91 (13.8%)	52 (7.9%)	3.07	Agree
3	Educated women contribute more effectively to national development.	230 (35.0%)	281 (42.7%)	94 (14.3%)	53 (8.1%)	3.05	Agree
4	Financial barriers restrict women's access to education.	247 (37.5%)	260 (39.5%)	98 (14.9%)	53 (8.1%)	3.07	Agree

Grand Mean = 3.07 (Agree)

Table 2 shows that most respondents strongly agreed or agreed that education improves women's employability, enhances skills acquisition, increases productivity, and that financial barriers hinder access to education. The grand mean of 3.07 reflects a generally positive perception of educational empowerment.

These findings demonstrate that respondents recognize education as a vital component of women's empowerment and human capital development. Nevertheless, the inferential analysis indicated that educational empowerment, when considered independently, was not statistically significant in explaining human capital development.

Table 3: Respondents' Perception of Overall Women Empowerment and Human Capital Development (N = 658)

S/N	Statement	SA	A	D	SD	Mean	Decision
1	Women empowerment contributes significantly to human capital development.	248 (37.7%)	267 (40.6%)	90 (13.7%)	53 (8.1%)	3.08	Agree
2	Empowered women improve family welfare and educational outcomes.	241 (36.6%)	272 (41.3%)	91 (13.8%)	54 (8.2%)	3.07	Agree
3	Women's participation in decision-making strengthens community development.	233 (35.4%)	276 (41.9%)	95 (14.4%)	54 (8.2%)	3.04	Agree
4	Combined economic and educational empowerment enhances human capital development.	255 (38.8%)	262 (39.8%)	90 (13.7%)	51 (7.7%)	3.10	Agree

Grand Mean = 3.07 (Agree)

Table 3 reveals that respondents generally agreed that women empowerment contributes significantly to human capital development, improves family welfare, strengthens community development, and that the combined effects of educational and economic empowerment enhance development outcomes. The grand mean of 3.07 indicates a high level of agreement among respondents. This finding supports the overall view that women empowerment is multidimensional and that its combined dimensions have a stronger influence on human capital development than any single dimension considered in isolation. This is consistent with the hypothesis test, which established a statistically significant relationship between overall women empowerment and human capital development.

Table 4: Comparative Perception of Women Empowerment in Rivers and Delta States (N = 658)

S/N	Statement	SA	A	D	SD	Mean	Decision
1	Women in Rivers State experience similar empowerment challenges as those in Delta State.	215 (32.7%)	287 (43.6%)	102 (15.5%)	54 (8.2%)	3.01	Agree
2	Government support for women empowerment is similar in both states.	201 (30.5%)	289 (43.9%)	112 (17.0%)	56 (8.5%)	2.96	Agree
3	Educational opportunities for women are comparable in Rivers and Delta States.	206 (31.3%)	281 (42.7%)	113 (17.2%)	58 (8.8%)	2.96	Agree
4	Economic opportunities available to women are similar across both states.	212 (32.2%)	276 (41.9%)	112 (17.0%)	58 (8.8%)	2.97	Agree

Grand Mean = 2.98 (Agree)

Table 4 indicates that respondents generally agreed that women in Rivers and Delta States experience similar levels of empowerment, government support, educational opportunities and economic opportunities. The grand mean of 2.98 reflects an overall agreement that the two states share comparable empowerment conditions. This suggests that respondents perceive little variation between Rivers and Delta States regarding women empowerment initiatives and their contribution to human capital development. The descriptive findings are consistent with the Chi-square result, which showed no statistically significant difference between the two states in the impact of women empowerment on human capital development.

Summary of Hypotheses Testing

Hypothesis	χ^2 Calculated	χ^2 Critical	Decision	Remark
H ₀₁ : No significant relationship between women empowerment and human capital development.	7.93	7.815	Reject H ₀	Significant
H ₀₂ : No significant relationship between educational empowerment and human capital development.	3.44	7.815	Accept H ₀	Not Significant
H ₀₃ : No significant relationship between economic empowerment and human capital development.	2.53	7.815	Accept H ₀	Not Significant
H ₀₄ : No significant difference between Rivers and Delta States regarding the impact of women empowerment on human capital development.	1.83	7.815	Accept H ₀	Not Significant

Results

A total of 658 valid responses were retrieved from the 700 questionnaires administered across Rivers State and Delta States, representing a response rate that supported meaningful statistical analysis. Respondents were drawn from both states, with Rivers State accounting for 54.1 percent of the sample and Delta State accounting for 45.9 percent. The sample was predominantly composed of individuals within economically productive age brackets, with the 30 to 39 year category forming the largest share at 37.8 percent, followed by the 40 to 49 year category at 29.3 percent. Male respondents constituted 54.7 percent of the sample and female respondents 45.3 percent, a distribution that, while including a substantial proportion of women as the primary unit of analysis, also incorporated male perspectives to strengthen the study's interpretive depth. In terms of educational attainment, the majority of respondents had completed secondary education (41.2 percent) or tertiary education (33.4 percent), with a smaller proportion reporting no formal education (7.9 percent).

Employment status among respondents varied considerably, with a substantial proportion engaged in informal sector activity such as petty trading and small scale farming, a smaller proportion in formal salaried employment, and the remainder unemployed or engaged in unpaid household labor. This distribution is consistent with the study area's broader labor market structure, in which formal employment opportunities remain limited relative to the size of the working age

population and it provides useful context for interpreting the economic empowerment results reported below.

Descriptive analysis of respondents' views on economic and educational empowerment showed generally favorable perceptions. A majority of respondents **agreed or strongly agreed** that women's economic participation improves household welfare and productivity, and a similar majority agreed that education enhances women's employability and skill acquisition. These patterns indicate broad recognition, at the level of perception that both dimensions matter for development outcomes in the study area.

To test whether these perceptions translated into statistically confirmed relationships, four hypotheses were examined using the chi square test of independence at the 0.05 level of significance, with a critical value of 7.815 at three degrees of freedom in each case.

The first hypothesis examined the overall relationship between women empowerment and human capital development, drawing on composite responses across all four empowerment dimensions. The computed chi square value of 7.93 exceeded the critical value, leading to rejection of the null hypothesis. This result indicates a statistically significant relationship between women empowerment, taken as a combined construct, and human capital development in Rivers and Delta States.

The second hypothesis tested the relationship between women's access to education, considered

in isolation, and human capital development. The computed chi square value of 3.44 did not exceed the critical value, and the null hypothesis was accordingly retained. Educational empowerment, tested independently of the other dimensions, did not show a statistically significant relationship with human capital development.

The third hypothesis tested the relationship between women's economic empowerment, considered in isolation, and human capital development. The computed chi square value of 2.53 likewise fell below the critical value, and the null hypothesis was retained. Economic empowerment, tested independently, did not show a statistically significant relationship with human capital development.

The fourth hypothesis tested whether the impact of women empowerment on human capital development differed between Rivers and Delta States. The computed chi square value of 1.83 fell below the critical value, and the null hypothesis was retained, indicating no statistically significant difference between the two states in this regard.

Disaggregating the descriptive responses further reinforces this pattern. Under the objective addressing economic empowerment, more than three quarters of respondents agreed or strongly agreed that access to financial resources improves women's economic independence, yet a comparable proportion also agreed that the lack of sustained economic opportunity limits women's productivity, indicating that respondents perceived both the value and the constraints of current economic participation simultaneously. A similar duality appeared in responses on educational empowerment, where strong agreement that education improves employability coexisted with substantial agreement that financial barriers restrict access to education in the first place. These paired responses suggest that respondents were not simply expressing uncritical optimism about empowerment but were distinguishing between the potential benefits of education and income and the structural conditions currently limiting their realization, a distinction that aligns closely with the statistical pattern observed in the hypothesis tests.

Taken together, these results show a clear pattern. Women empowerment produced a statistically significant relationship with human capital development only when its dimensions were considered jointly. Neither education nor economic empowerment, tested as standalone variables,

reached statistical significance, despite favorable descriptive perceptions of both. The absence of a significant difference between Rivers and Delta States further suggests that this pattern holds consistently across both settings within the Niger Delta region.

Discussion

The pattern of results, a significant relationship for the combined empowerment construct alongside non-significant relationships for education and economic empowerment tested in isolation, offers a more nuanced reading of Human Capital Theory than the theory's classical formulation suggests. Schultz (1961) and Becker (1964) treat investment in education, skills, and health as a direct route to productivity gains. The present findings indicate that this route is not automatic. Respondents in both states expressed strong positive perceptions of education's value, with several linking education to women's ability to support their families financially. Yet these perceptions did not translate into a statistically significant relationship between education and human capital development when tested independently. Several respondents pointed to the likely reason. Education without corresponding employment opportunities does not readily convert into productive capacity, as reflected in observations that many women complete schooling but still struggle to secure suitable jobs.

A similar pattern emerged for economic empowerment. Respondents widely associated women's income and financial independence with improved household welfare, and several linked this directly to investment in children's education. Despite this, the chi square test for economic empowerment did not reach significance. Field responses again suggest an explanation grounded in the quality rather than the presence of economic activity, since women's economic participation in the study area is concentrated in petty trading and informal, low capital enterprise that often yields income too small to substantially change household circumstances. This is consistent with Sen's (1999) capability approach, which holds that economic opportunity only expands genuine freedom when it is substantial enough to alter the range of choices available to a person. Where economic activity remains confined to low productivity, informal sectors, its capacity to generate measurable human capital returns is correspondingly limited.

Read together, these two null findings indicate that the individual dimensions of empowerment examined in this study function more as necessary conditions than sufficient ones. Education and income each matter, but neither, on the evidence presented here, is strong enough on its own to move the needle on human capital development in Rivers and Delta States. This helps explain why the combined empowerment construct produced a significant result even though its constituent dimensions, tested alone, did not. This interpretation aligns with the multidimensional conception of empowerment advanced by Malhotra et al. (2002), which treats economic, educational, social, and political dimensions as interacting components of a single process rather than as independent levers.

The absence of a significant difference between Rivers and Delta States further suggests that this dynamic is not peculiar to one state's institutional or cultural context but reflects a broader pattern across the Niger Delta region. Both states share comparable exposure to oil dependent economies, informal labor markets, and socio-cultural constraints on women's participation in leadership, conditions that plausibly explain why the relationship between empowerment and human capital development takes a similar shape in both settings.

The pattern identified here also speaks to an under-examined dimension of the empowerment literature, namely the role of social and political participation as a conditioning factor rather than a parallel, independent channel. Malhotra et al. (2002) and Moser (1993) both suggest that empowerment operates through interlocking social relations rather than through the simple accumulation of individual resources such as schooling or income. The present findings lend indirect support to this view. If education and economic participation had operated as independent, additive determinants of human capital development, one would expect each to register a significant relationship on its own, with the combined measure simply reflecting their sum. Instead, the combined measure was significant while its parts were not, which is more consistent with an interactive or conditional relationship, in which social and political inclusion shape the extent to which education and income can be converted into productive outcomes. This is consistent with field observations in the study area, where respondents linked limited returns to

education and economic activity with an absence of institutional support and continued underrepresentation of women in decision making structures. Where women lack the standing to influence resource allocation, market access, or policy implementation, the individual gains achieved through schooling or income generation appear to remain contained at the household level rather than translating into broader productivity or community level development.

These findings carry a specific implication for policy design. Interventions that expand access to education or income in isolation, without complementary investment in employment creation, credit access, and institutional support, are unlikely to produce measurable gains in human capital development. The results instead support a coordinated approach in which economic, educational, social, and political empowerment are pursued together, consistent with the reasoning behind Sustainable Development Goals 4 and 5 as joint rather than separate targets. This reframes the theoretical contribution of Human Capital Theory in the study area. Investment in human capital appears necessary but not, by itself, sufficient, unless it operates alongside the broader structural and institutional conditions that allow such investment to convert into productive outcomes.

Conclusion and Policy Recommendations

This study examined the relationship between women empowerment and human capital development in Rivers and Delta States, drawing on Human Capital Theory and testing both a combined measure of empowerment and its economic and educational components in isolation. The evidence establishes that empowerment functions as a critical determinant of human capital development, but not uniformly across its dimensions. When treated as a comprehensive, interconnected construct spanning economic, educational, social, and political participation, women empowerment showed a statistically significant relationship with human capital development in the study area. When economic and educational empowerment were tested independently, however, neither produced a statistically significant effect, despite respondents' consistently favorable perceptions of both.

This pattern indicates that education and economic participation function as necessary but not independently sufficient conditions for human

capital development in Rivers and Delta States. Education appears to operate as a foundational element that enables other forms of empowerment rather than as a direct determinant on its own, particularly where employment opportunities remain limited. Similarly, women's economic participation improves household welfare, but its broader developmental effect is constrained by low earnings, informal employment, and restricted access to financial resources. It is the interaction among empowerment dimensions, rather than any single dimension, that produces a measurable and statistically significant contribution to human capital development. This finding reframes Human Capital Theory's central proposition for the study context. Investment in education and income remains important, but its developmental returns depend on the presence of complementary structural and institutional conditions.

These conclusions translate into three policy priorities. First, economic empowerment initiatives should move beyond subsistence level support toward structured and sustainable livelihood opportunities. This includes expanding access to credit and financial inclusion programs, aligning vocational training with viable sectors of the local economy, and supporting women's transition from informal to formal economic activity, since the present findings suggest that informal, low capital economic participation does not generate sufficient returns to independently drive human capital development.

Second, educational interventions should be repositioned within a broader empowerment framework rather than pursued as a standalone strategy. Given that access to education alone did not produce a statistically significant effect, policy should link formal education with vocational training, digital literacy, and skills that correspond directly to labor market demand, while also addressing barriers such as financial constraints and early marriage that continue to limit girls' and women's educational attainment.

Third, given that the combined empowerment construct, rather than any isolated dimension, produced the significant result, policy frameworks should explicitly integrate economic, educational, social, and political empowerment rather than treating them as separate interventions. This includes strengthening women's participation in household, community, and institutional decision-making processes, since expanded agency appears to reinforce the returns to education and

economic participation rather than operating independently of them.

A further implication follows from the apparent conditioning role of social and political participation identified in the discussion. Policy frameworks that expand women's representation in community and institutional decision making are unlikely to function as a fourth, independent lever alongside education and income. Instead, they may serve as the mechanism through which gains in education and income become convertible into measurable productivity and development outcomes. This suggests that sequencing matters in policy design. Expanding women's access to schooling and credit without a parallel investment in their institutional voice risks reproducing the pattern observed in this study, in which favorable individual outcomes fail to aggregate into significant human capital development at the community or state level.

Taken together, these findings suggest that sustainable human capital development in Rivers and Delta States depends less on isolated empowerment programs and more on coordinated policy design that addresses education, income, and participation simultaneously. Future research examining the specific institutional and structural conditions that mediate the conversion of education and income into measurable human capital outcomes would extend the contribution of this study.

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