*Original Research Article*

Impact of Foreign Aid and Institutional Efficiency on Educational Outcomes: A Study of Out-of-School Children in West African

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ABSTRACT

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| **Aims:** The study investigated the impact of foreign aid and institutional efficiency on educational outcomes, specifically focusing on out-of-school children in West Africa. By examining the interplay between external funding and local institutional capacities, this research aims to identify the conditions under which foreign aid can effectively improve educational access and outcomes.  **Study Design:** Human Capital Theory and ex-post facto design were adopted.  **Duration of study:** Data used for this were secondary sourced from World Bank database on institutional effectiveness for period of 34 years 1990-2023.  **Methodology:** Purposive sampling technique was to select countries in West Africa which are Nigeria, Ghana, Senegal, Mali, and Burkina Faso. The selection is based on their similarity in the variables of study and other economic conditions.  Data were analysed using panel generalized method of moments-GMM.  Results- There was a strong persistence effect across the models, where past levels of out-of-school children significantly influence current levels. Educational aid (FAid) has a statistically significant positive effect on out-of-school OSC 0.897 (p<0.01), literacy rate LR 0.9611 (p<0.01). However, the effect is small and becomes insignificant in Models (1) and (3), suggesting that foreign aid alone may not substantially reduce out-of-school children rates. The R2 and Adjusted R2 explain around 65% to 72% of the variance in literacy rate.  **Conclusion:** Foreign aid on education has little impact on educational outcomes, specifically focusing on the rate of out-of-school children (OSC) and literacy rates (LR) in West Africa. West Africans countries educational attainments were studied, therefore educational outcomes may not be explained other than foreign aid and institutional efficiency considered in this study. |

*Keywords: out-of-school, foreign aid, education, efficiency and outcome*

1. INTRODUCTION

Education is widely recognized as a key driver of economic and social development. In West Africa, however, the educational landscape is marked by significant challenges, including low enrollment rates, high dropout rates, and poor learning outcomes. One of the most pressing issues is the large number of out-of-school children, a problem that undermines the region's efforts to achieve sustainable development and improve the quality of life for its people.

This is at the heels of increasing foreign aid which has long played a critical role in supporting education in the West African region. Through various financial, technical, and policy-oriented assistance, international donors have sought to address the region's educational challenges. And scholars like Maruta, Banerjee and Cavoli (2020) have laid claim to the fact that foreign aid has shown positive impacts on economic growth and educational outcomes in developing countries, particularly in West Africa, with education aid found to be more effective than other types of sectorial aid, especially as institutional quality improves. According to Yogo (2017), higher aid has been associated with increased primary completion rates in sub-Saharan Africa. However, the effectiveness of foreign aid in improving educational outcomes remains a subject of debate. While aid can provide much-needed resources, its impact often depends on how efficiently institutions utilize these resources.

Institutional efficiency, defined as the capacity of public and private entities to manage resources and implement policies effectively, is crucial in determining the success of educational interventions. Thus the interplay of foreign aid and institutional efficiency significantly affects educational outcomes in West Africa. Foreign aid provides financial resources and technical support to bolster education systems, particularly in areas with limited government funding. This aid can help build schools, train teachers, and supply learning materials, contributing to improved access and quality of education. However, the impact of foreign aid largely depends on the efficiency of institutions responsible for managing these resources. In countries with strong, transparent, and accountable institutions, aid is more likely to reach intended beneficiaries, leading to enhanced educational outcomes such as higher enrollment, retention, and literacy rates. On the other hand, in nations where institutional inefficiencies like corruption, poor governance, and weak oversight prevail, the benefits of foreign aid may be undermined. Resources may be misallocated, wasted, or mismanaged, resulting in minimal improvements in educational quality and access.

Thus, the relationship between foreign aid and educational outcomes is not linear; it is mediated by the effectiveness of the institutions responsible for implementing education policies and managing external resources. Strengthening institutional efficiency is crucial for maximizing the positive effects of foreign aid on education in West Africa. While some research suggests that institutional quality does not significantly influence the aid-growth relationship (Ogundipe & Ola-David, 2014), others emphasize the importance of sound macroeconomic policies and pro-development strategies for maximizing aid effectiveness (Ogundipe & Ola-David, 2014; James, 2024). Weak governance, corruption, and bureaucratic inefficiencies in many West African countries often lead to the misallocation of resources, limiting the impact of foreign aid. Consequently, many children continue to remain out of school despite the inflow of external support.

This study seeks to investigate the impact of foreign aid and institutional efficiency on educational outcomes, specifically focusing on out-of-school children in West Africa. By examining the interplay between external funding and local institutional capacities, this research aims to identify the conditions under which foreign aid can effectively improve educational access and outcomes. The findings of this study will provide insights into how both donors and local governments can collaborate to develop more efficient and impactful educational policies, ultimately reducing the number of out-of-school children in the region.

1.2 **The out-of-school situation in West Africa**

The out-of-school situation in Africa generally is a significant and complex challenge. Sub-Saharan Africa, in particular, has the highest rates of children and adolescents out of school globally, contributing nearly half of the world’s total. Nearly one in five children in sub-Saharan Africa are out of school, amounting to approximately 98 million children and young people. Of these, girls are disproportionately affected, with almost 34% of adolescent girls out of secondary school compared to 29% of boys (UNESCO, 2022).

In West Africa, the situation has remained a significant concern, as the growing rate of out-of-school children is pushing the region to a global highest level. The region accounts for a large portion of the world’s out-of-school children. In many countries, particularly those with high poverty rates, access to basic education remains limited. For example, Nigeria has one of the highest numbers of out-of-school children (20 million) globally (UNESCO, 2022), with millions unable to access formal schooling.

The associated causes stem from a complex blend of socioeconomic, cultural, political, and structural factors. For instance, political instability, armed conflict, and insurgencies (like those linked to Boko Haram) have forced millions to flee their homes, especially in countries like Nigeria, Mali, and Burkina Faso. Displacement disrupts schooling, with refugee children and internally displaced persons (IDPs) facing barriers to accessing education in host communities or camps. Also, the effect of poverty is still high, making it a major barrier to education in West Africa. Families facing economic hardship cannot afford school fees, uniforms, or learning materials. Child labour is also prevalent, as children may be required to work to support family income, preventing them from attending school.

Many schools in West Africa lack adequate infrastructure, trained teachers, and essential learning materials. Poor-quality education also drives children away from school, as they may not see the value in attending. In rural parts of countries like Niger, Chad, and Mali, children face limited access to schools due to long distances, underdeveloped infrastructure, and limited resources for establishing local schools. Inadequate funding and institutional challenges still persist as many West African countries struggle with limited public funds for education, while inefficient institutional practices can hinder education access. Some countries rely on foreign aid, yet these funds are often insufficient or poorly managed, limiting the education system's capacity to address these barriers effectively.

Cultural norms and practices, such as early marriage and household responsibilities, equally play a critical role and often prevent girls from attending school. In some regions, boys also face challenges, especially if they are expected to support their families. This has heightened gender disparities, with a significant number of girls out of school, particularly in rural areas.

Other educational outcomes within the region are equally not impressive. Efforts to address these challenges include initiatives from international organizations and NGOs, which focus on providing emergency education, vocational training, and financial assistance to families, along with policies to improve infrastructure, train teachers, and remove gender-based barriers. However, a significant gap remains, requiring sustained commitment from local governments and the international community to ensure all children in West Africa have access to quality education.

**Theoretical framework**

The Education for All (EFA) and the 4th Sustainable Development Goal (SDG-4) as proposed by UNESCO and the United Nations, respectively provide frameworks that aim to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. These frameworks emphasize international cooperation, such as foreign aid, and institutional efficiency in achieving universal access to education. The global frameworks provide a useful lens for evaluating how foreign aid supports national efforts to achieve the goal of universal education and how institutional capacities facilitate or hinder this progress, particularly in reducing out-of-school children in West Africa.

Theoretically, Human Capital Theory by Gary Becker (1964) emphasizes the importance of education in improving individual productivity and societal growth. In accordance with the theory’s belief, foreign aid directed toward education can be seen as an investment in human capital, which is essential for improving educational outcomes and reducing the number of out-of-school children. Therefore, the theory provides a foundation for understanding how investments in education (through foreign aid) enhance the quality and accessibility of education, leading to long-term societal benefits, including improved literacy rates, poverty reduction, and economic development.

The Institutional Theory put forth by John Meyer & Brian Rowan (1977) on the other hand, provides a guide to examine how institutional structures, norms, and efficiency impact organizational performance. Impliedly, the theory helps to analyze how institutional capacity, governance, and administrative efficiency in West African countries influence the implementation and outcomes of foreign aid in the education sector. It can explore how efficient institutions manage foreign aid to improve access to education for out-of-school children. Institutional weaknesses, such as corruption, mismanagement, and lack of accountability, could hamper the effective utilization of aid, affecting educational outcomes.

Thus, the SDGs/EFA framework connects the study to global objectives, situating the research within a broader developmental context; the human capital theory provides an explanation of why investments in education are critical and how foreign aid serves as an external boost to this investment; and institutional theory offers an insight into how the efficiency of local institutions determines the effectiveness of aid in delivering educational improvements. These theories give a holistic view that creates the basis for analyzing the dynamics of foreign aid, institutional efficiency, and their combined effects on educational outcomes in West Africa.

**Empirical review**

Foreign aid's impact on educational outcomes in developing countries is complex and varies across contexts. While some studies found positive effects of education aid on primary enrollment and overall educational outcomes (Lekhak, 2024; Lekhak, 2023; Maruta *et al*., 2020; Arshad, Farooq, Sultana, & Farooq, 2016), others reported no significant impact on secondary or higher education enrollment (Kemal & Jilani, 2016). Lekhak (2024), in his study, found that foreign aid positively impacts primary school completion rates, but not necessarily secondary school enrollment rates, and economic factors, governance, and school-related variables also play crucial roles in improving educational outcomes. Similarly, Lekhak (2023) states that education aid effectively enhances education outcomes in developing countries, with institutional efficiency and factors like corruption, the pupil-teacher ratio, and female teachers also playing important roles. Another study by Sessou, Hidrobo, Shalini and Huybregts (2024) on cash transfer programme in Mali revealed significant improvements in schooling outcomes for girls, highlighting the importance of financial support in reducing barriers to education. Arshad, Farooq, Sultana and Farooq (2016) found through a time-lag analysis that foreign aid may have delayed positive effects on educational indicators.

Those with contrary findings include Asongu and Tchamyou (2019) whose findings revealed that while primary enrollment may improve, the effects on secondary and tertiary education are negligible, indicating a potential misalignment in aid distribution.

Considering what may determine the impact of foreign aid on education in Africa, Maruta *et al*. (2020) and Miningou (2019) found that the effectiveness of aid is influenced by factors such as institutional quality, governance, and political stability. Noting that, regional differences in aid effectiveness exist, with education aid being more effective in South America, health aid in Asia, and agricultural aid in Africa (Maruta *et al*., 2020). Ejuvbekpokpo and Hassan (2019) found that institutional quality directly affects educational outcomes; weak institutions correlate with lower educational attainment in low-income SSA countries. Effective governance, reduced corruption, and a strong rule of law are essential for maximizing the benefits of foreign aid in education.

**Conceptual Framework**

Presented in Figure 1 is a conceptual framework for the impact of foreign aid and institutional efficiency on educational outcomes in West Africa, integrating the key theoretical perspectives, relationships between variables, and relevant frameworks.

Institutional Efficiency

Foreign Aid

Educational Outcomes

**Figure 1:** Conceptual Framework

The framework also indicates the moderating effect of institutional efficiency on the envisaged relationship between the variables. Foreign Aid (Independent Variable) can be considered in different forms, such as: 1) Development Assistance such as grants or loans aimed at improving education infrastructure, providing learning materials, teacher training, and capacity building; 2) Humanitarian Aid which is direct aid aimed at providing access to education in crisis situations (conflict zones, displacement, etc.); and 3) Conditional vs. Unconditional Aid depending on whether or not the aid is tied to specific reforms or policies within recipient countries. Educational outcomes is the dependent variable measured in terms of the number of out-of-school children and literacy rates. The hypothesis is that effective and well-targeted foreign aid can enhance educational outcomes by reducing barriers (such as financial or infrastructural) to schooling for out-of-school children.

This is, however, to be moderated by institutional efficiency which refers to the effectiveness of government bodies, educational institutions, and other implementing agencies in proper management and oversight of aid funds, successful translation of foreign aid into actionable educational reforms, and putting in place mechanisms to ensure that aid reaches the intended beneficiaries without corruption or misallocation. The hypothesis is that institutions' efficiency moderates foreign aid's impact on educational outcomes. High institutional efficiency amplifies the positive impact, while inefficiency can undermine or negate the benefits of foreign aid.

This conceptual framework integrates the theories reviewed ― the Human Capital Theory (HCT) and Institutional Theory ― to justify foreign aid as an investment in education and human development and to explain how the effectiveness of this investment is contingent on the quality of governance and institutional structures. In relation to the the human capital theory, investments in education and skills development ― in this case foreign aid ― enhance individual productivity, leading to economic growth and societal development. By reducing barriers (e.g., financial constraints, lack of schools), aid can increase literacy rates and reduce out-of-school children thereby improving human capital stock in West Africa. Thus, the HCT assumes that investments in education will translate into positive outcomes, however, institutional efficiency determines whether aid actually leads to human capital development. If institutions are corrupt or ineffective, aid may not reach its intended beneficiaries, undermining the expected returns on investment. But where the institutions are effective, foreign aid in education can derive the expected outcomes. This fits in the institutional theory, which framework explicitly incorporates as a moderating variable. It examines how formal and informal institutions (rules, norms, organizations) shape behavior, policies, and outcomes. It emphasizes the role of governance, accountability, and organizational structures in determining the success or failure of interventions. With institutional effectiveness varying across contexts, in West Africa, weak governance, political instability, and bureaucratic inefficiencies may hinder aid effectiveness. The framework acknowledges this by stressing the need for strong institutions to maximize aid’s impact on education. In summary, framework bridges the two the two theories. While HCT, which focuses on the "what", justifies the investment in education via foreign aid, IT, focusing on the "how", explains why this investment may succeed or fail based on institutional quality.

This conceptual framework, thus, captures the dynamics between foreign aid, institutional efficiency, and educational outcomes, with specific attention to the complexities of out-of-school children in the West African context.

2. material and methods

The study focused on selected countries in West Africa which are Nigeria, Ghana, Senegal, Mali, and Burkina Faso. The selection is based on their similarity in the variables of study and other economic conditions. Thus, these countries provide a diverse range of contexts, capturing different levels of aid dependency, institutional capacity, and educational challenges.

**Data**

For uniformity and authenticity, the data on the dependent, independent, and control variables for the study were sourced basically from the World Bank database. Data on institutional effectiveness were obtained from the World Bank’s Worldwide Governance Indicators. The data was obtained for a period of 34 years covering from 1990 to 2023 corresponding 10-data for these indicators are included in our analysis to serve as moderating factors.

The variables in the study and their source are described in the Table 1.

**Table 1:** *Definition of Variables*

|  |  |  |
| --- | --- | --- |
| **Variable** | **Definition** | **Source of Data** |
| **1. Dependent Variables** |  |  |
| *Out-of-School children* | Out-of-school children are those who are of official school-going age but are not enrolled in formal education systems. This includes children who may have never attended school, those who enrolled but dropped out, and those who are irregularly attending or enrolled in non-formal education that does not meet official standards. The term often encompasses barriers such as poverty, conflict, cultural factors, and limited access to schools, which can prevent children from accessing or remaining in school, particularly in regions facing economic or political instability.  This was measured at the primary level of education. | World Bank Indicators |
| Literacy rate | The youth literacy rate was used. It measures literacy among people aged 15–24 who can read and write with understanding in their native or another language. It is a key indicator used to measure the level of education in a country or region and is often employed to assess educational development and social progress. | World Bank Indicators |
| **2. Independent Variable** |  |  |
| Foreign aid | Net official development assistance and official aid received by the educational sector. | World Bank Indicators |
| **3. Moderating Variable** |  |  |
| *Governance effectiveness* | The index varies from 0 to 100 and measures the quality of the civil service, public services, and the degree of independence of these from political pressures | World Bank Indicators |
| *Control of corruption* | World Bank indicator which measures the extent to which public power is exercised for private gain (percentile rank among all countries, which ranges from (lowest) zero to (highest)100 rank) | World Bank Indicators |
| **4. Control Variables** |  |  |
| GDP | GDP is the gross domestic product measured at current U.S. dollars. | World Bank Indicators |
| Inflation | Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. | World Bank Indicators |
| Poverty rate | Poverty headcount ratio at $2.15 a day which is the percentage of the population living on less than $2.15 a day at 2017 purchasing power adjusted prices. | World Bank Indicators |

**Model specification**

Guided by an informed relationship between the variables and the hypotheses, the study sought to examine the relationship between foreign aid and educational outcomes in West Africa while considering the moderating effect of institutional effectiveness and the effect of some control variables. These relationships, simply put, are as in the following models. The relationship, in Generalized Method of Moments (GMM) form, is given as:

To test for the moderation effect of institutional effectiveness, proxied by governance effectiveness (*GovEff*) and control of corruption(*CoC*), on the specific educational outcomes, the relationship in equation (1) becomes as in equations (2) and (3).

Where , , and are the models’ intercepts, to , to , and to are coefficients of the regressors, 𝜆 is country-specific fixed effects, and , , and are the error terms, all for countries *i* at time *t*.

The models' parameters were estimated using the two-step System Generalized Method of Moments (GMM) technique of analysis as had used by several scholars like Lekhak (2024); Ibrahim (2023); and Lekhak (2023). This method was chosen because it improves on the original GMM strategy, increasing efficiency and reducing biases in the estimate process. System GMM is commonly employed in dynamic panel data models with lagged dependent variables as regressors. By mixing moment conditions from both the level and first-difference equations, the System GMM estimator efficiently tackles these issues.

3. results and discussion

The results in Table 2 provided the Panel Generalized Method of Moments (GMM) estimation of a model where the dependent variable is Out-of-School Children (OSC).

**Table 2:** *Impact of Foreign Aid on Out-of-School Children*

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **(1)** | **(2)** | **(3)** |
| OSC(-1) | 0.8972\*\*\*  (0.0261) | 0.9185\*\*\*  (0.0649) | 0.9113\*\*\*  (0.0852) |
| *FAid* | 0.0024  (0.0024) | 0.0023\*\*  (0.0012) | 0.0028  (0.0030) |
| *GDP* | - | -5.37E-07\*\*  (4.06E-07) | -8.64E-07\*\*  (6.33E-07) |
| *Inf* | - | 9567.469  (30888.20) | 1330.169  (44808.14) |
| *PovR* | - | 16863.36\*  (16080.65) | 20163.30\*\*  (23211.64) |
| *FAid\*CoC* | - | - | -0.3105\*\*  (0.1145) |
| *FAid\*GovEff* | - | - | -0.2340\*\*  (0.0905) |
| Constant | 634871.400  (944837.400) | 754373.6\*\*  (680634.0) | 1009289  (972556.1) |
| Observations | 151 | 154 | 154 |
| R-squared | 0.7285 | 0.6523 | 0.6574 |
| Adjusted R-squared | 0.6273 | 0.6394 | 0.6325 |
| AR (1) | 0.0045 | 0.0802 | 0.0799 |
| AR (2) | 0.0927 | 0.1620 | 0.1625 |
| Hansen J-statistic | 0.6528 | 0.2528 | 0.3272 |
| *Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, and \* p<0.1.*  *Source: Computed using Eviews.* | | | |

The table present the results of three regression models (columns (1), (2), and (3)) analyzing the impact of various factors on the dependent variable (OSC). From the results, the lagged dependent variable (OSC(-1)) indicate a strong persistence effect across the models, where past levels of out-of-school children significantly influence current levels. It suggests that the issue is persistent over time with high coefficient (close to 1) and significance (p < 0.01). In Model (2), Foreign Aid to education or simply educational aid (FAid) has a statistically significant positive effect on OSC. However, the effect is small and becomes insignificant in Models (1) and (3), suggesting that foreign aid alone may not substantially reduce out-of-school children rates. Of great concern is that, the positive relationship is against expectation. FAid is expected to have a negative relationship with OSC, hence a negative impact. This rather positive relationship obtained shows that FAid does not help in tackling the problem of OSC in West Africa.

An increase in Gross Domestic Product (GDP) is seen to be associated with a reduction in the rate of out-of-school children, implying that better economic conditions could improve educational outcomes within the West Africa region. Inflation (Inf) is found to have no significant impact on the outcome in these models, suggesting it may not be a direct factor influencing out-of-school rates in the region. However, it was discovered that higher poverty rates (PovR) are associated with an increase in out-of-school children, highlighting the detrimental impact of poverty on educational participation.

Considering the interaction of FAid with institutional efficiency in terms of control of corruption (CoC) and Government Effectiveness (GovEff), since FAid is effective, its interaction with these has remained of no impact, maintaining a positive relationship with OSC. This suggests that the effectiveness of foreign aid in reducing out-of-school children does not improve even when there is better control of corruption and government effectiveness

The R-squared and Adjusted R-squared indicate that the models explain around 65% to 72% of the variance in the dependent variable, indicating a moderate to good fit. The Arellano-Bond serial correlation tests – AR (1) and AR (2) – suggest no significant autocorrelation issues with the models and Hansen J-statistic indicates no over-identification problem with the instruments used in the models given that the p-values are higher than 0.05.

Deduced from this analysis is that the persistence effect of out-of-school children is strong with its previous values being the most significant predictor in this study, showing strong persistence in the number of out-of-school children over time. The small and often statistically insignificant effect of foreign aid on reducing out-of-school children at the primary level implies that foreign aid, as it currently stands, is not addressing the core barriers to educational participation even if accompanied by institutional quality (control of corruption and government effectiveness). Only GDP growth correlates with reduced out-of-school rates, while poverty exacerbates the problem. This finding does not supports earlier studies like those of Lekhak (2024); Lekhak (2023) Maruta *et al*. (2020); Arshad *et al*. (2016); and Sessou *et al*. (2024) who found that foreign aid positively impacts educational outcomes like primary school completion rates. However, the findings aligns more with the findings of works like Kemal & Jilani (2016) who found no impact foreign aid on education in Africa. The fact that even when interacted with other internal institutional factors the impact of foreign aid on reducing the number of out-of-school children remains meaningless implies that these do not essentially influence the impact of foreign aid in this direction.

**Table 3:** *Impact of Foreign Aid on Literacy Rate*

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **(1)** | **(2)** | **(3)** |
| LR(-1) | 0.9611\*\*\*  (0.0037) | 0.9637\*\*\*  (0.0046) | 0.9628\*\*\*  (0.0066) |
| *FAid* | 2.87E-11  (9.79E-11) | 0.6271\*\*  (0.1121) | 0.3325\*\*  (0.7401) |
| *GDP* | - | 0.2261\*\*  (0.0394) | 0.3840\*\*  (0.0164) |
| *Inf* | - | -0.0206\*\*  (0.0314) | -0.504315\*\*  (0.6151) |
| *PovR* | - | -0.6980\*\*  (0.0067) | -1.2712\*\*  (0.2064) |
| *FAid\*CoC* | - | - | 0.0470\*\*  (0.9626) |
| *FAid\*GovEff* | - | - | 0.5739\*\*  (0.5672) |
| Constant | 634871.400  (944837.400) | 3.7063\*\*\*  (0.4356) | 6.0672  (0.0287) |
| Observations | 154 | 154 | 157 |
| R-squared | 0.9979 | 0.9979 | 0.9979 |
| Adjusted R-squared | 0.9978 | 0.9978 | 0.9978 |
| AR (1) | 0.0027 | 0.0041 | 0.0501 |
| AR (2) | 0.3371 | 0.1620 | 0.1300 |
| Hansen J-statistic | 0.0908 | 0.0718 | 0.0535 |
| *Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, and \* p<0.1.*  *Source: Computed using Eviews.* | | | |

Table 3 presents results from three regression models examining how foreign aid (FAid) influences literacy rates (LR) while controlling for several other variables. The result indicates that the lagged literacy rate LR(-1), capturing the previous year's literacy rate, accounts for the persistence of literacy levels over time. With a coefficient of 0.9611 (p<0.01), it is highly significant indicating that past literacy rates strongly predict current literacy rates.

The effect of Foreign Aid (FAid) on literacy rates becomes positive and statistically significant in models 2 and 3, suggesting that its impact is observable when additional factors like GDP, inflation, and poverty rates are considered. In model 1, though FAid has a positive coefficient it is statistically insignificant, suggesting that foreign aid alone does not have a noticeable impact on literacy rates in this specification.

Macroeconomic factors of GDP, inflation (Inf), and poverty rates (PovR), included in models 2 and 3, affect literacy rates. For instance, GDP has positive and statistically significant coefficients (0.2261 and 0.3840, respectively) in both models, suggesting that higher GDP is associated with higher literacy rates. As for Inflation (Inf), negative and statistically significant coefficients of -0.0206 and -0.5043 were established for the models respectively. This suggests that a higher inflation level lowers w literacy rates. Similarly, PovR (Poverty Rate) has negative and statistically significant coefficients (-0.6980 and 1.2712) in models 2 and 3 respectively, indicating that higher poverty rates are associated with lower literacy rates. Thus, higher levels of GDP are found to positively affect literacy rates, while higher rates of inflation and poverty negatively influence literacy rates within the West African region.

Institutional quality, reflected as the interaction terms in model 3 shows that control of corruption (CoC) and government effectiveness (GovEff) enhances the impact of foreign aid on literacy rates in the region. With the coefficient of FAid\*CoC (interaction of foreign aid and corruption control) positive (0.0470) suggests that foreign aid may have a positive effect on literacy when corruption is controlled, though the effect is weak. Foreign Aid Interaction with Government Efficiency (FAid\*GovEff) being positive with an estimate of 0.5739 indicates that foreign aid may have a stronger positive impact on literacy when government efficiency is higher. This makes the quality institutions in West Africa a relevant factor in raising the literacy level in the region.

The high R-squared values indicate that the models explain nearly all the variation in literacy rates. Similarly, the adjusted R-squared values are high indicating that adding variables improves the model fit without over-fitting.

Testing for autocorrelation with AR(1) and AR(2) tests show that there is no significant autocorrelation in the residuals. The result (p-values) of the Hansen J-statistic indicate that the instruments used in the models are valid and do not suffer from over-identification issues.

This finding on the impact of foreign aid on educational outcomes (literacy rate) supports earlier studies like those of Lekhak (2024); Lekhak (2023) Maruta *et al*. (2020); Arshad *et al*. (2016); and Sessou *et al*. (2024) who found that foreign aid and economic factors, governance, institutional efficiency, and school-related variables positively impacts educational outcomes like primary school completion rates. However, the findings aligns more with those of Maruta *et al*. (2020); Ejuvbekpokpo and Hassan (2019); and Miningou (2019) who found that foreign aid on education in Africa impact is influenced by factors such as institutional quality, governance, and political stability. This implies that these internal factors are essential for maximizing the benefits of foreign aid in education.

Critically viewing and interpreting the findings from the Panel GMM estimations in Tables 2 and 3 through the lenses of **HCT** and **IT,** it was expected (according to HCT) that **foreign aid, an** educational inputs, should logically contribute to improved **educational outcomes** by reducing Out-of-School Children (OSC) and increased **literacy rates (LR)** by addressing financial, infrastructural, and systemic barriers to education. However, with the e**mpirical finding showing that** foreign aid exhibits a **positive (unexpected) and largely insignificant effect** on OSC, contradicting Human Capital Theory. This suggests that while aid is provided, it **fails to function effectively as an investment** in human capital, possibly due to misallocation, poor targeting, or ineffective program implementation. With the the failure of foreign aid to reduce OSC means that the educational system may not be receiving the right kind of investment to enhance human capital — either because the aid is not reaching the intended beneficiaries, or because it is **not addressing the foundational barriers to school participation**, such as poverty, child labour, conflict, and social norms.

**Also, the HCT expects that, f**oreign aid, especially when optimally utilized should raise literacy levels — a direct indicator of human capital. This e**mpirical finding aligns with this as** foreign aid had a **positive and significant impact on literacy** when macroeconomic factors are considered. This partially aligns with Human Capital Theory — suggesting that foreign aid can contribute to human capital development, **but only under certain favorable economic and institutional conditions.** Thus, the effectiveness of foreign aid in building human capital is **conditional**, and literacy as an outcome may be more responsive to such investments than school enrollment alone.

**From the IT** angle, it was expected that institutional quality (low corruption, high government effectiveness) should strengthen the effectiveness of foreign aid. However, it was e**mpirically found that e**ven when **foreign aid is interacted with control of corruption and government effectiveness**, the impact remains **statistically insignificant or even adverse** on OSC. This shows that **institutional quality does not moderate the relationship** in the expected direction for OSC. This implies that either the **level of institutional efficiency is still insufficient** to make foreign aid impactful, or the problem of OSC is **too complex**, involving social, cultural, and economic dimensions beyond institutional scope alone.

**In terms of literacy rates, it was found that the** interaction between foreign aid with **CoC and GovEff**, the effect on literacy rates becomes **positive and statistically significant**. This validates IT that **good governance and efficient institutions increase the effectiveness of aid, meaning that f**oreign aid can improve educational outcomes **only when channeled through robust and transparent institutions**.

4. Conclusion

Historical trends in OSC and LR are significant predictors of current rates. This reflects a challenging situation where improvements in educational participation and literacy take time to manifest significant changes. The analysis shows a limited and mixed impact of foreign aid on educational outcomes. In the case of out-of-school children, foreign aid (FAid) has a positive but small and often statistically insignificant effect across the models. This unexpected positive relationship indicates that foreign aid alone may not effectively reduce the rates of OSC. It suggests that without addressing underlying systemic issues, foreign aid might not lead to desired educational improvements. For literacy rates, foreign aid shows a positive and statistically significant effect but more when other macroeconomic variables such as GDP, inflation, and poverty rates are accounted for. This suggests that the benefits of foreign aid on literacy rates are more observable when economic conditions and governance factors are favorable.

However, of note is that macroeconomic factors matter. GDP growth is consistently associated with improved educational outcomes. Higher GDP correlates with lower rates of out-of-school children and higher literacy rates, highlighting the importance of economic growth in enhancing educational access and quality. Conversely, higher poverty rates (PovR) are linked to increased OSC and decreased literacy rates, underlining the detrimental impact of poverty on educational participation. Additionally, inflation negatively affects literacy rates, suggesting that economic instability may hinder educational progress.

The interaction of foreign aid with indicators of institutional quality, such as control of corruption (CoC) and government effectiveness (GovEff), demonstrates its significance in enhancing the impact of foreign aid. While foreign aid alone does not effectively reduce OSC, its impact on literacy rates improves when combined with better institutional efficiency. The positive coefficients for interactions in literacy models suggest that foreign aid's effectiveness increases with stronger governance and corruption control.

Consent (where ever applicable)

The author declare that ‘written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

Ethical approval (where ever applicable)

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