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## EDITORIAL DESK

Volume 3 of the West African Journal of Educational Administration and Planning (WAJEAP) has a total of ten articles that were the products of well researched papers presented at the international conference held in May 2024 at the Presbyterian University of East Africa in Kikuyu, Nairobi, Kenya. The conference had well over 100 participants that gathered at the ambiance of PUEA environment, which was well attended by over 25 universities across the globe including Nigeria, Serra Leone, Kenya, South Africa, Australia and University of South Alabama in United States of America. All the articles have been peer reviewed and plagiarism checks conducted on them before publication.

I, therefore, want to deeply appreciate the management team of the Presbyterian University of East Africa for making this publication a reality. All the writers and authors are congratulated for passing the stringent measures set by the guild of editors.

Congratulations to everyone, and I wish you a prosperous Christmas celebration in advance.

**Prof. M. O. B. Mohammed** FNAEAP,  
*Head, Editorial Team*

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# A ROBUST RESOURCE ALLOCATION MODELS FOR SECONDARY SCHOOLS

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## ABSTRACT

*The paper reviews education resource allocation models from developed countries to identify the gaps and fill them for use in developing countries. Schools in developing countries are faced with severe resource constraints and greater accountability for student's academic achievement. Education resources have been availed by the National Government Kenya and the families, yet over 76 of students in Kenya who sat for the Kenya Certificate of Secondary Examination (KCSE) between 2008 and 2011 scored grade C plain, In Meru County over the same period, the score was even more disastrous as they scored a grade C- minus. Research shows a positive relationship between resource allocation and academic achievements. Education resource allocation in the Western world is done using models, however, the same cannot be said of Africa, more especially Kenyan. The gap identified will aid in designing a hybrid model that could be harnessed for efficient resource allocation in public schools in developing countries.*

**Keywords:** Resource allocation models, academic achievement,

## INTRODUCTION

Resource allocation refers to the process of allocating limited resources to different parts of an organization to satisfy the overall goals (Jie Wu et. al., 2011). According to Mohammad (2011), student achievements at any point are a cumulative function of the current and the prior resource inputs such as family's socioeconomic status, peer effect and institutional resources inputs. However, an educationist deals with and controls the school's specific resource inputs such as students, teachers, class size, facilities, instructional resources, and professional development among others for the continual achievement of the educational goals. Student academic achievement in Kenya in KCSE between 2008 to 2011 was averaged at grade C plain, while in Meru County over the same period, the score was a (C-)minus. The cause of this dismal performance has not been investigated whether it is the mode of resource allocation or something else. This study reviewed the literature on resource allocation models to identify the gaps and construct a robust resource allocation model suitable for public schools. Common resources in school broadly include personnel, technology, professional development, power, material, time and money. The resources work as the collaborative school management cycle which integrates goal setting, need identification, policy making, planning, budgeting, implementation, and evaluating (Cadwell, 1988; Spinks, 1992) towards school goal achievement.

In Canada, resources are channelled by the central and the State Governments through the School-Based Management councils (SBM). The focus of school-based management has been the decentralization of power. The question is, "Who at the school site is the power given to?" Power is shifted most often from the central administration to a council at the school site. councils may be composed of administrators, teachers, parents, community members and sometimes students. In this way, SBM empowers groups who typically have not had much power in managing schools (Odden 1992). The policy is also intended to encourage positive

participation from teachers, principals and parent representatives on the school board committee (Yadolla, 2006; Cheung, 2009). Further (McInerney 2003) argues that it promised greater freedom and authority for principals to exercise their leadership. However little attention has been given to empowering school sites with control over information, professional development (knowledge) or compensation systems (rewards). Furthermore, when SBM programs are analysed, the general conclusion is that the extent of decision-making responsibility transferred to site teachers and administrators is limited.

Studies of decentralization in the private sector, however, have indicated that decentralization of power is most likely to lead to performance improvement if accompanied by organizational changes that enhance the information, knowledge and skills of local participants and that align the reward system with clearly articulated desired outcomes (Odden 1992). In Kenya, the Education ACT 2010 mandates the allocation of resources to the Board of Management (BOM), a loose and unaccountable form of management that prepares school budget estimates as well as resource allocation decisions. Both SBM in Canada and BOM in Kenya are characterized by a lack of a concrete resource allocation policy which could have generated Models for fair resource administration and instead leave this important role to be executed with no clear guidelines.

Studies conducted in several countries have shown that resource allocation affects students' academic achievement in public schools. Education resources in the developed world are distributed through resource allocation models. However, the same cannot be said of Kenya where the Ministry of Education (MOE) statistics show that 76% of the students who sat for the KCSE examination between 2008 and 2011 scored grades C plain and below. Existing research studies are based on resource allocation models from developed countries that may not have been useful in the Kenyan setting. This implies that there is a need to carry out an analytical survey of the literature on existing resource allocation models. Resource allocation decisions are some of the major tasks of a school principal as defined by UNICEF (2000).

### **Resource Allocation Models**

Many students face unique and profound challenges that require personalized and customized resource support, and dedicated responses to support them in whatever settings they are enrolled. In Kenya, resource allocation has been decentralized through the Education Act 2010 to the board of management (BOM). However, the composition of the management team has not been given much attention, yet we know sound decision are very scarce and can only be expected from a thoroughly vetted management team. Given the prevalent situation, a resource allocation model (RAM) is required to make public funding more fair and transparent. With a model, student and school needs will be the key determinant for funding which will also reflect the characteristics of the individual school and their students. The targeted and equity-loading components of the RAM are about delivering funding to students who require additional support to gain the full benefit of their education. Schools will receive detailed information in their RAM funding advice and get a clear understanding of how the allocation for each of these loads was determined. This reflects a commitment to ensuring greater transparency and consistency in the way in which funding is allocated to schools. Extensive consultation on how each of the loadings has occurred with key stakeholders and the related policy areas of the department will help design a domesticated hybrid model. This study reviews five resource allocation models whose findings will be used to design a hybrid model for resource allocation.

### **Professional Judgment Model**

This model was initially established as a resource cost model (RCM) by chambers and parish, this has become the most- widely used costing out approach (Rebell, 2007). This approach entails asking a "group of educational experts to identify effective educational strategies" (Odden, 2003) for all students. Then, they determine the exact components needed to fulfil those needs, as well as what each of those components would cost. After summing these costs, a determination can be made on how much is required for each student. An advantage of the professional judgment approach is that it draws on the expertise "of highly qualified practitioners who are experienced in both programs. implementation and resource allocation and are familiar with the learning needs of the region or locale" However, (Rebell, 2007; Odden, 2003) offers a disadvantage that there is no clear connection between the ingredients identified by the experts' panel and student outcomes, that calls for further investigation to determine the strength of the relationship if it does exist.

### **Successful School District**

Model A sound approach in determining adequacy is the Successful District Approach. This approach entails looking at districts that have been successful in having their students meet proficiency standards (Odden, 2003). An advantage of this approach is that it provides a link between cost and desired outcomes (Rebell, 2007). Furthermore, they are relatively inexpensive to conduct and can be completed in a timely fashion. Rebell (2007) however addresses several disadvantages of this methodology. First, it fails to include large urban or small districts and usually looks to districts that are largely homogenous making it much too difficult for large districts to draw relevant conclusions due to disparity in district demographics.

It also relies heavily on districts having maintained accurate data, which isn't always the case, and finally, these studies make it difficult to appropriately calculate any additional resources needed for higher needs students. This calls for a model that would address a heterogeneous society composition common in the developing countries of the world.

### **Cost Function Analysis Model**

The cost function approaches model is used to determine adequacy. It incorporates regression analysis and other precise statistical analyses to determine the cost of adequate education (Rebell, 2007). The precise calculated cost depends on the desired outcomes of these schools or the district. The advantage of this model is that it can precisely identify those districts that are successful because statistical methods accommodate school districts that are efficient which could otherwise pose obstacles.

The disadvantages however outweigh the advantages. First like the successful district approach, the model depends on copious amounts of data on input prices which are not always available. Its success is highly dependent on the accuracy of data. It also fails to identify the necessary strategies to produce desired results. The model therefore depends on desired outcomes, which begs the question of the appropriateness of the tools used to determine this cost. A hybrid model would address the limitation by recommending a regression of dependent variables against independent variables cost.

### **Evidence-Based Model (EBM)**

Odden & Pacus (2008) developed an Evidence-Based Model to determine how schools should allocate their resources to meet the needs of their students and provide a framework for determining the appropriate expenditure levels of those resources. The influence of EBM is

currently found in several states egg Wyoming, Arkansas, Wisconsin, Kentucky and other states.

The EBM addresses major components of school resources and offers suggestions based on empirical evidence. Furthermore, recommendations for high schools are based on a prototypical school size of 600 students. Therefore, any school exceeding or falling short of this number simply must make appropriate proportional adjustments to satisfy the EBM requirements. Those components are Core content teachers (25:1 ratio at the high school level) and specialist teachers (33% of teaching staff). Extended support staff (extended day, extended teachers, tutors, e.g. evening classes). Specialized education (special education, career and vocational education). Professional development (teacher training, instructional coaches), Additional support (teachers, compensation. pupil support services, instructional materials, technology).

The major advantage of this approach is that it uses research-based strategies to guide its recommendations (Odden, 2003). The suggestions provided by the EBM have been proven to yield the desired results and are effective in its use of school funds. However, that same advantage may also be a weakness to the extent that not all results of empirical evidence can be generalized to other populations (Rebell, 2007). There exists the possibility that the recommendations made according to the EBM have not been tested in new environments applies to the developing countries of Africa, Asia and the Caribbean.

At the same time, a particular successful reading intervention program implemented in a school with a specific population may not yield similar positive results with a different student population in a different state.

#### **Institutional-Wide Resource Allocation Model**

This model was developed by Duderstadt (2000) which he also calls Responsibility Centre Management. Resource allocation decisions are shared between academic units, administrative units, and the central administration. After determining the strategic priorities, this alternative allows critically important units to keep the resources they generate, makes them responsible for meeting costs they incur, and then levies a tax on the unit's expenditures to provide a central pool of resources for supporting central operations and facilitating flexibility funding.



<b>Model</b>	<b>Resource categories studied</b>	<b>Limitations</b>
Professional Judgment Model (Chambers and Parish,1997)	Prioritized need identification of the resource	No clear connection between the ingredients identified by expert's panel and students'
Successful School District model (Odden,2003)	Resource requirement for proficiency standards.	Does not include large urban or small districts, it focuses on largely homogenous districts, making it less useful for large districts that have largely heterogeneous demographics
Cost Function Analysis Model Rebell (2007)	Looks at the aggregate cost of Education resource	Copious amount of data is required. Its success is highly determined by the accuracy of data. It does not identify the necessary strategies to produce desired results
Evidence Based Model (EBM) Odden & Piccus (2008)	Core content teachers, specialist teachers, specialized education, professional development and additional staff	Not all results of empirical evidence can be generalized to other populations. Recommendations of EBM have not been tested in new environments
Responsibility center management Duderstadt (2000)	Resources are determined using strategic priorities. Major resource is funds.	Quality of shared decision is low and slow

The Priority-based Resource Allocation Model (PBRAM) takes cognisance of the institutional strategic plans which incorporate all stakeholders. This is unlike the Professional Judgement Model by Chambers and Parish which only incorporates the experts. Table 1 shows the results of the comparison between PBRAM and other allocations for instruction Models, where a score of Metric I (one) is assigned to a model to represent the presence of a resource addressed by that model, and zero (0) otherwise.

**Table 1: Comparison of The PBRAM with other allocated for Instruction Models**

Model	A	B	C	D	E	Total weight of the Resource
Professional Judgement model	1	0	1	1	0	3
Successful school district Model	0	1	0	0	1	2
Cost Function Analysis	0	1	1	1	0	3
Evidence Based Model (2013)	0	1	1	1	1	4
Institutional-wide Model	0	1	0	0	1	2
Proposed PRAM Model	1	1	1	1	1	5

**Key: A=Home Background characteristics; B=Personnel; C=Instructional Resources; D=Physical Facilities and E= Interpersonal Relationships.**

As shown in Table 1, the last column represents the total weight of the resources that a model enjoys as its strength. The total weight of the resources therefore represents the strength of the model. The proposed PRAM model is the only one that achieves /enjoys the full weight of 5, which makes it stronger than all other models discussed.

### THE PRIORITY-BASED RESOURCE ALLOCATION MODEL (PBRAM)

The frame within this scale has five sections. Each section is a schema. These schemas are Home Background characteristics.

- A. Personnel.
- B. Instructional Resources.
- C. Physical Facilities, and
- D. Interpersonal relationships
- E. Inter-personal relationships

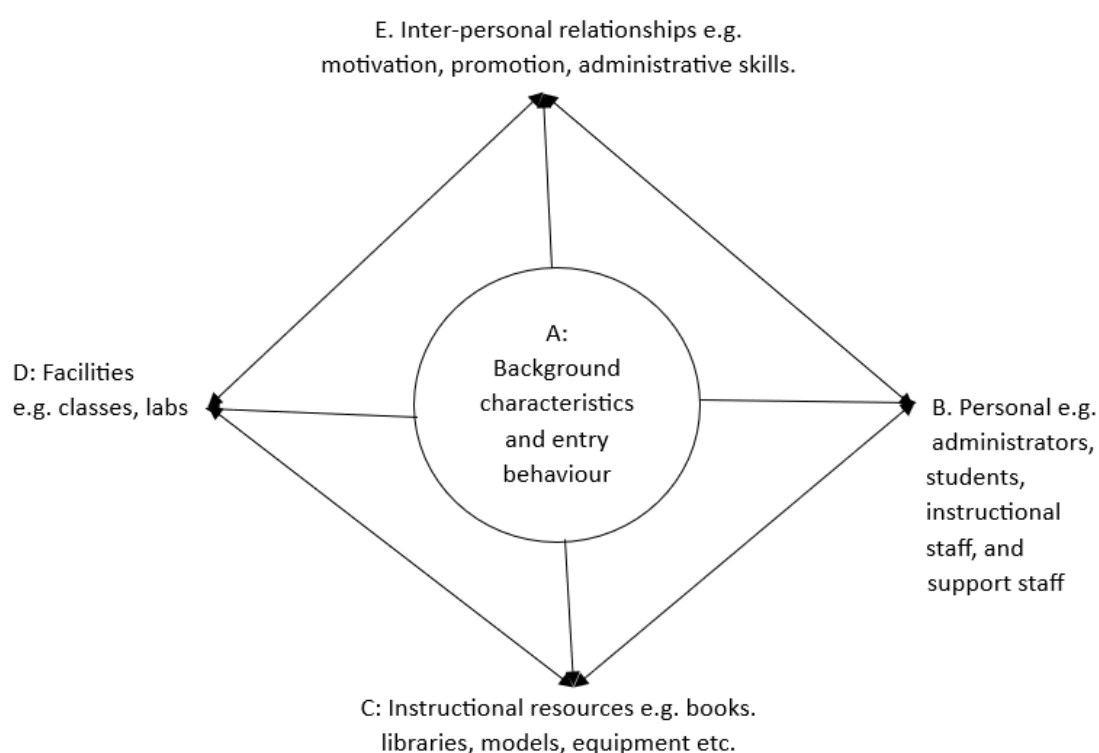


Figure 1: The PBRAM for a Basic School

### Comparison of the Priority-based Resource Allocation Model (PBRAM) with other Resource Allocation Models

The priority Based Resource Allocation model has been constructed from analysis of data collected in Kenya which is a third-world country where most of the existing resource allocation models are from the developed world. Oduro and Macbeath (2003) warn against borrowing Western-designed models to the African context. However, some of the highlights of the contribution of the strength of PBRAM against other existing models include five major subsections that make up the model. Each subsection is a subschema. To generate the component of each subsection, PBRAM recommends that a board conduct a regression

analysis to generate an array order of resource allocation priorities in each schema except the schema "A", which is outside the control of the school.

PBRAM takes cognisance of the institutional strategic plans which incorporate all stakeholders. This is unlike the Professional Judgement Model by Chambers and Parish which only incorporates the experts. Table 4.30 shows the results of the comparison between

Studies examining resource allocation in education and connecting spending to student performance by Diane (2003) established a strong relationship between resources and student success. The study established both the level of resources and their explicit allocation seems to affect educational outcomes. It found that resource allocation in improved districts involves a trade-off process in which funds, time, staff and other resources are divided among competing needs, often creating inequalities. The study concludes that wise use of resources not only makes financial sense but also has implications for student success. The same argument is reiterated by Latika (2008) in his study on education inputs, student performance and school finance reforms in Michigan which found out that school finance reforms which increase expenditures might be more effective if spending increases are targeted towards increasing teachers' salaries that are perhaps a crude proxy for teacher's quality.

Studies by Diane (2003), Latika (2008), and Yadar (2007) on resource allocation and academic achievement, all concur on the significant role of resource input and student success while Newton 1997 further argues that education resources be allocated in a more accessible way. However, none of the studies reviewed above has addressed the prioritized allocation of resources when it is clear that some academic areas require more attention in resources, for instance, Newton (1997) found that the magnitude of instruction in science-based disciplines is powerful when instructional resources are allocated in a more accessible way while Yadar (2007) argues that no course in science and mathematics can be considered as complete without including some practical work. The SBM, BOM and the live western models discussed in Table 1 all fail to provide a clear guide for efficient allocation of resources. This implies a need for a model design that would be fairer in resource allocation in public secondary schools.

Like all the reviewed models, Western-constructed and tested models are less likely to fare well in third-world countries basically due to their economic, demographic and political variabilities. This explains why Oduro and MacBeath (2003) warn against implementing Western-designed models to the African environments. This implies a need for a robust hybrid model capable of addressing the uniqueness of the new settings in terms of demographic trends, economic levels and political environments.

## **CONCLUSION**

The study has reviewed a missing connection between the ingredients identified by an expert panel and student academic achievement, The successful school district model fails to include large urban or small districts which renders it less useful for large districts with heterogeneous demographics, the cost function analysis model does not identify the necessary strategies to produce the desired results, the evidence-based models' recommendations have not been tested in new environments while the responsibility centre management model is characterized by low-quality decisions that come too late.

Due to the gaps identified in the models discussed. We intend to come up with a hybrid model that would take cog naissance of the shortcomings of the earlier models, then pilot it in new

environments like in a third-world public school setting to fortify it against implementation challenges in such settings.

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