

A Critique of Resource Allocation Models for Secondary Schools

Kaberia E.Limukii¹, Kindiki Jonah², Ndiku J. Mualuko³

^{1,3} Masinde Muliro University of Science and Technology
P O Box, 190 - 50100
Kakamega, Kenya

²Moi University
P O Box 3900, Eldoret, Kenya

Abstract

This paper reviews education resource allocation models from developed countries with the intention of identifying the gaps and fill them for use in the 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 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 resources 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 the developing countries.

Keywords: Resources allocation models, academic achievement,

Introduction

Resource allocation refers to the process of allocating limited resources to different parts of an organization in order to satisfy the overall goals (Jie Wu *et. al.*, 2011). According to Mohammad (2011) student achievements at any point is a cumulative function of the current and the prior resource inputs such as family's' socio-economic status, peer effect and institutional resources inputs. However, an educationist deals with and controls the school's specific resources inputs such as students, teachers, class size, facilities, instructional resources, professional development among others for 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 literature on resource allocation models with a view of identifying the gaps and constructing 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 integrate goal setting, need identification, policy making, planning, budgeting, implementation, and evaluating (Cadwell, 1988; Spinks, 1992) towards school goal achievement.

In Canada resources are channeled by the central and the State Government through the School Based Management councils (SBM). The main 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 parents representative 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 system (rewards).Furthermore, when SBM programs are analyzed, 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 allocation of resources to the Board of Management (BOM), a loose and un accountable 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 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 need to carry out an analytical survey of 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 have 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 fairly and transparent. With a model, student and school needs will be the key determinant for funding which will also reflect the characteristic 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 in order 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 loading 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 loading has occurred with key stake holders and the related policy areas of the department will help design a domesticated hybrid model.

This study reviews five resource allocation models whose finding would 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 fulfill 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 program, implementation and resource allocation and are familiar with the learning needs of the particular 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 the 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 in expensive to conduct and can be completed in 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 conclusion 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

Cost function approaches model is used to determine adequacy. It incorporates regression analysis and other precise statistical analysis to determine the cost of an adequate education (Rebell, 2007). The precise calculated cost depends on 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 in efficient which could otherwise pose obstacles.

The disadvantages however outweigh the advantages. First like the successful district approach, the model depends on copious amount 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. An hybrid model would address the limitation by recommending a regression on dependent variables against independent variables cost.

Evidence Based Model (EBM)

Odden & Piccus (2008) developed the Evidence-Based Model as a means 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 eg 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 has to make appropriate proportional adjustments to satisfy the EBM requirements. Those components are:

Core content teachers (25:1 ratio at the high school level), 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 desired results and is 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's.

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 allow critically important units to keep the resources they generate, make them responsible for meeting costs they incur, and then levies a tax on unit's expenditures to provide a central pool of resources for supporting central operations and facilitating flexibility funding

Table 1: Summary of the Reviewed Resource Allocation Models

Model	Resource categories studied	Limitations
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 outcomes.
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 are 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

Discussion

Studies examining resource allocation in education and connecting spending to student performance by Diane (2003) established a strong relationship between resource 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 increases 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 resource be allocated in a more accessible way.

However none of the studies reviewed above has addressed prioritized allocation of resources when it is clear that some academic areas require more attention in resource, for instance Newton (1997) found that the magnitude of instruction in science based disciplines are 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 five western models discussed in Table 1 all fails 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 the third world countries basically due to their economic, demographic and political variabilities. This explains why Oduro and Mac beath(2003) warns against implementing western designed models to the African environments. This implies a need for a robust hybrid models capable of addressing the uniqueness of the new settings in terms of demographic trends, economic levels and political environments.

4. Conclusion

The study has reviewed a missing connection between the ingredients identified by expert panel and student academic achievement, The successful school district model fails to include large urban or small district 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 center management model is characterized by low quality decisions that comes too late.

Due to the gaps identified in the models discussed, We intend to come up with an 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 challenge in such settings.

REFERENCES

- Cadwell, B.J.,Spinks,J.M (1988). *The self-managing schools*. London, Falmer Press p.5,71,88.
- Chambers, Jay, & Thomas Parrish. (1983). *The Development of a Resource Cost Model Funding Base for Education Finance in Illinois*. Stanford, CA: Associates for Education Finance and Planning.
- Cheng, Y.C and Mok, M.M.C (2007). School based management and paradigm shift in education, An empirical study, *International Journal of Education Management*, 21(6), 517-542.
- Diane, P.Z.H., Cynthia, L.S. and Lotte (2003). *Examination of Resource Allocation in Education: Connecting Spending to Student Performance*. Southwest Education Development Laboratory 211 East even Street; Austin, Texas 78701. www.sedl.org
- Duderstadt, J.J.(2000). *A University for the Twenty First-Century*. Ann Arbor: University of Michigan Press.
- Jie, Wu., Qingxiam, An., Shujahat, Ali and Liang, Liang.(2011). *DEA Based Resource Allocation Considering Environmental Factors*. Journal home page: Www.elsevier.com.
- Latika, C. (2009). *Education Inputs, Student Performance and School Finance in Michigan*. *Economics of Education Review* 28 (2009)90-98.
- McInerney, P. (2003). *Moving into dangerous territory? Educational leadership in a devolving education system*. *International Journal of Leadership in Education*, 6(1), 57-72.
- Mohammad, A.D.(2011). *Misallocation of Student Teacher Ratio, Class Size and Per Student Expenditure Leads To Wastage of Resources and Lower Academic achievement: An issue in Resource Management*. *International research Journal of Finance and Economics* ISSN 1450-2887 issue 62 (2011).
- Newton, P., Driver, R., & Osborne, J. (1999). *The place of argumentation in the pedagogy of school science*. *International Journal of Science Education*, 21(5), 553–576.
- Odden, A. (2003). *Equity and adequacy in school finance today*. *Phi Delta Kappan*, 85(2), 120-125.
- Odden, A., & Picus, L. (2008). *School finance: A policy perspective (4th Ed.)*. New York: McGraw-Hill.
- Oduro, G..K.T. and Mac Beath, J.(2003). *Traditions and tensions in leadership: the Ghanian experience*, 33(3):441-445.
- Rebell, M. (2007). *Professional rigor, public engagement and judicial review: A Proposal for enhancing the validity of education adequacy studies*. *Teachers College Record* 109(6), 1303-1373. Teachers College, Columbia University.

- Republic of Kenya: (2010). Kenyan Constitution; Bill of rights. Nairobi: Government printer.
- Republic of Kenya: Session paper No. 1 of 2005 on policy framework for education Training and research.
- Republic of Kenya: (1998).Master Plan on education and training (1997-2010).Nairobi: Government printer.
- Yadar,K. (2001) Teaching of Life Sciences. New Dehli, Anmol Publication.ltd India.
- Yatollah, M. (2006) Globalization and decentralization of Management: A case study of the feasibility of application of school Based Management in Iran's secondary schools, Alberta Journal of education research,52(1),84-98.