

RELEVANCE OF THE SYSTEM THEORY TO THE EFFECTIVE AND EFFICIENT MANAGEMENT OF EDUCATION IN NIGERIA

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ABSTRACT

This paper examined the relevance of the system theory to the effective management of education in Nigeria. The systems theory was postulated to indoctrinate managers on the importance of holistically managing organizations. It was premised on the assumption that, the whole is greater than the sum of its parts. The theory opened the eyes of managers of educational organizations to carry everybody and every segment of the organizations along for effective performance of organizational goals and individual needs. This paper also treated the tenets of the theory concepts and its applicability in the educational system. It also highlighted its relevance to effective and efficient management to education in Nigeria and finally the criticisms of the system theory to management of education in Nigeria.

Keywords: Relevance, System Theory, Effective Management, Education, Nigeria.

Introduction

In the 1920s a biologist named Ludwig Bertalanffy presented his systems theory to a philosophy seminar at the University of Chicago. Chapman (2005) notes that Ludwig Bertalanffy was a biologist who began the systems theory study in life sciences which eventually developed into the modern field of ecology. Ecology as we know it now is the study of the systems of nature. Bertalanffy believed that nothing could be understood by isolating merely one part of what plays a significant role in system. The history of systems theories includes contributions from such similar thinkers as Alfred North Whitehead, Ludwig von Bertalanffy, Anatol Raspopport, Kenneth Boulding, Paul A. Weiss, Ralph Gerard, Kurt

Lewin, Roy R. Grinker, Willian Gray, Nicolas Rizzo, Karl Menninger, and Silvano Arieti among others. This paper traces the principles of the systems theory, its concepts, its relevance to effective management of education in Nigeria and criticisms against it. As a response to the increasing fragmentation and duplication of scientific and technological research and decision making in the first half of the 20th century, Ludwig von Bertalanffy advanced what he called Allgemeine Systemlehre (theory of systems or, more popularity, general system theory (GST). Scholars began to view the administration and management of organization and educational institutions as a system. The basic idea behind the system theory is that, to understand a phenomenon, we must recognize that the whole is greater than the sum of all its parts. According to Burke (2009) the system theory challenges the reductionist approach where the individual part is the level of analysis and emphasized that it is the whole, the combination and inter-relationships of part that will generally provide insight into the functioning of the parts and the whole. Burke further maintains that proposed by systems theory is to model complex entities created by the multiple interaction of components by abstracting from certain details of structure and component, and concentrating on the dynamics that define the characteristic functions, properties, and relationships that are internal or external to the system.

According to Guberman (2004:89), the assumptions of the systems theory were as follows:

1. *There is a general tendency toward integration in the various aspects or parts of an organization*
2. *Such integration seems to be centered in a general pattern*
3. *Such pattern may be an important means for aiming at exact interaction and interdependence within the organization*
4. *Developing unifying principles running vertically through the system brings us nearer the goals of the individuals and unity of organization*
5. *This can lead to a much-needed integration in effective management of organization*

Bertalanffy's idea behind systems theory is that nothing can be explained by isolating a component of system. The theory attempted to view the school as a unified, purposeful organization, or as a system composed of inter-related parts. Vancouver (2005) notes that the system theory suggested that instead of dealing separately with the various parts, educational administrators/managers should look at the educational system as a whole. This was based on the insinuation that, the activity of any part of the system has a direct bearing on every other part of the educational system. In order to properly explain and gain a better understanding of the system theory and its holistic properties had to be analyzed to find the root of problem.

Concept of System Theory

System theory was propounded by a biologist Ludwig Von Bertalanffy in 1920. Bertalanffy asserts that a system is an interrelated and interdependent set of elements functioning as a whole. The theory suggests the functionalist approach as the best way of examining the role of a subsystem in a larger system. Bertalanffy posits that it was not enough to understand the parts, that it was also important to understand the relationship among the parts. Bertalanffy's idea behind system theory is that nothing can be explained by isolating a component of system. The theory attempted to view the school as unified purposeful organisation or as a system composed of interrelated parts. This was based on the insinuation that the activity of any part of the system has a direct bearing on every other parts of the

educational system. A system theory has open system which relatively highly permeable boundaries while the closed system has relatively rigid impermeable boundaries thus sub-system is a system that exist within a large system. Every system, supra system or subsystem has an environment. System theory also rests on beliefs that in all system like the society, the school, education, the classroom, has different parts performing different functions but in a way that each part interacts and is interdependent with the other parts and with the system (environment) around it. Therefore, what affect one part; affect the other parts in the system and its environments. Bertalanffy further points out that the history of the concept can be traced to Aristotle, who suggested that the whole is greater than the sum of its parts. A system is an entity composed of a number of parts, the relationship of their parts and attributes of both the parts and the relationship. Thus, the university can be termed a system because of the number of its parts, the relationship of these parts and the interwoven nature of their function. For instance, in the university, there are Catering, Academic, Registry and Works Department; whatever happens to one sub-system affects the whole system. A problem arising from the university system may be approached by first examining the relevant sub-system of the university system. System theory thus helps administrators to be very alert bearing in mind that disruption of a sub-system can damage the entire system. The system theory holds that an educational organisation is a social system made up of integrated parts; a system is a unit with series of interacted and interdependent parts, such that the interplay of any part affects the whole. A system is therefore a structure with interdependent parts. It refers to the integration of different components and relationships between them and their attributes, such that they form functionally related whole. The hierarchical and lateral structure in a system and their associated interactions and transformation are geared towards achieving the goal and purpose.

In its broadest conception, a “system” may be described as a complex of interacting components together with the relationships among them that permit the identification of a boundary-maintaining entity or process. In the broadest conception, the term connotes a complex of interacting components together with the relationships among them that permit the identification of a boundary-maintaining entity or process. A system can be defined as an entity, which according to Mele and Polese (2010) is a coherent whole such that a boundary is perceived around it in order to distinguish internal and external elements and to identify input and output relating to and emerging from the entity. A systems theory is hence a theoretical perspective that analyzes a phenomenon seen as a whole and not as simply the sum of elementary parts. The focus is on the interactions and on the relationships between parts in order to understand an entity’s organization, functioning and outcomes. This perspective implies a dialogue between holism and reductionism.

Components: Components refer to the parts-the smallest meaningful units that interact with each other to fulfill the purposes of the system. In a educational institutions teachers and other people and things that interact to carry out the functions of teaching and learning can be regarded as the components of the system.

Boundary: Boundary as a more or less arbitrary demarcation of units that are included within and that are excluded from the main system. It is the boundary that separates the system from its environment and filters the inputs and output from the system. Boundaries are often poorly drawn in the educational system since the school is an open system.

Environment: Environment as anything is it physical and social factor that is external to the boundaries of the system and has potential to affect all or part of the system. Every system or supra-system or sub-system has an environment. External constituencies for a school building, for example, include unions and the legislature. They can at any given time in the life of a school have influence on school activities or programmes.

Inputs: Inputs are those messages or stimuli that trigger off the internal components of a system to perform those activities for which the system was designed and instituted. Such inputs may take the form of people, materials, money and or information. Inputs are elements that enter the system across its boundary. They cause or enable the components interact in fulfilling the system's purposes.

Outputs: These are all that the system produces, either by design or by accident. Outputs can be intentional or unintentional and they entail altering the input. A school for example receives a student as an input, processes him/her over the years through lectures, assignments and counselling, and come out as an output in the form of a more learned, affective, cultured, educated and disciplined person (intended output) ready to enter the real world of employment; or he or she graduate as a rebel, a person who resists established authority and control (unintended output)

Open system: This is a system that has relatively highly permeable boundaries. Consequently, open systems receive inputs and provide outputs. The school for example exchange considerable amount of information across its boundaries with the external environment.

Close system: This is a system that has relatively rigid, impermeable boundaries. Lalande and Bammeister (2015) states that such systems receive very few inputs. There is little exchange of energy and information with the environment. No social system is completely closed; thus it is more accurate to speak of social systems being relatively closed or open.

Sub-system: A sub-system is a system that exists within a larger system. All systems except the very smallest are composed of subsystems, if the school is taken as a system, then administrative and support service units or departments and classes can be conveniently regarded as the sub-systems.

Supra-system: This is a larger system of which a particular system is a part. A school can be considered as a system, existing within a larger system, a school district or an educational zone. In this case, the school is a subsystem with respect to the district or educational zone which is the supra-system.

Equilibrium: This is the tendency of a system to achieve a state of balance or stability among the many forces or factors operating upon the system or within it. Nykpamp (2016) noted that, there is stationary equilibrium and dynamic equilibrium. A stationary equilibrium exists when there is a fixed point or level of balance to which the system returns after a disturbance. A dynamic equilibrium also called a steady state occurs when the equilibrium shifts to a new position of balance after a disturbance.

Disequilibrium: This is a state of instability or imbalance in which some components of the system overload others.

Entropy: This is the tendency of organization overtime to move towards randomness, chaos, disorder, lack of patterning, disorganization or death; that is, the tendency towards decrease in order and an increase in disorder within an organization.

Negatropy: This is the tendency of an organization to combat death or disorganization. It is also called negative entropy.

Equifinality: This is a property of a system which permits different results from similar inputs and similar results from alternate inputs.

Feedback: This is the process which the organization learns. Feedback is the input from the environment to the system, telling it how it is doing as a result of its output to the environment. It is the process which entails drawing some of the system's output back into the system as information inputs, so that possible discrepancies between intended output and actual outputs can be sensed.

Synergy: This is the belief that the whole is greater than the sum of its parts, in the management education, synergy encourages the interaction of different departments to become effective and more production than if they were to act in isolation.

Flow: This term pertains to the entry and exit of inputs and outputs respectively in a system. In the educational system, the inputs entering the school may not correspond with the outputs leaving the system in terms of quality and or quantity. This enables the system to fulfill its purposes of establishment.

Relevance of Systems Theory to the Effective and Efficient Management of Education in Nigeria

No educational manager can carry out management functions in isolation. He or she must make adequate use of all the human and material components of the school system to translate the aims of the curriculum into reality. Consequent upon this, the systems theory has relevance to the educational system in the following ways:

Systems theory is approached when one wants to study in a complex, open ended setting, where there are many unpredictable variables at work. According to Elujekwute (2019) the school is an example of an open system with inputs filtering through its boundaries. This theory is important to the effective management of education in the sense that, the school principal of a secondary school will understand that members of the immediate community have inputs into the management of the educational institution. In such a situation, he should be willing to accept suggestions from parents that are to assist in the management of the secondary schools. Systems theory is useful in providing a framework in which one study complex variables influencing one another. Checkland (2005) reports that, there are a lot of variables that constitutes a school system. The principal of a secondary school can utilize this knowledge and be able to identify extraneous variables filtering into the school system which could pose problems for the effective management of such schools. For example, the principal

who understand the influence of partisan politics on the efficiency of school management can advise his subordinates to shun partisan politics as it is bound to generate bad blood among the staff and negate the accomplishment of educational goals and objectives. Systems theory has the ability to show the complex web of relationships in operation as a system moves toward its goals. Checkland and Poulter (2006) notes that, the educational aims and objectives can be achieved, when all facets of the economy or policy formulation and implementation or agencies work in harmony and in this regard, both the Ministry of Education and the school administrators/managers can harmoniously work together towards translating the policy statements into reality when they realize that, they are all parts of a common system which is education. Systems theory is not limited historically as it can be used to help make meaningful predictions about what can be reasonably expected in the future. Arnold and Wade (2015) remarks that, projections are needed to be made in education for proper planning and also, planning for enrolment without paying attention to the availability of other educational facilities can only boil down to failure. In the university system for example, utilizing the knowledge from the systems theory, the university management can make projections for enrollment alongside the provision of other educational facilities such as the functional libraries, parking lots, laboratories instructional materials, lecture halls, academic staff and none-academic staff among others. A holistic approach to educational planning can result to effective utilization of scarce or available resources for effective teaching/learning and management of the university system.

Educational institutions operate in diverse and complex environment, with intensive interactions and multilateral impacts of external environmental factors, and to cope with them, educational administrators/managers are required to be able to make informed decisions and to keep the educational institutions focused to purpose. Adams and Hester (2013) notes that the educational managers utilizing the systems theory can scout for public acceptance in the host community knowing well that the external environment of a school has great influence on activities within the around the school. The systems approach attempts to view the world in terms of irreducibly integrated systems. It focuses attention on the whole, as well as on the complex interrelationships among its constituent parts. This way of seeing is not an alternative, but a complement, to the specialized way. Guberman (2004) maintains that the system theory is more all-embracing and comprehensive, incorporating specialized perspective, as one aspect of a general conception. It is based on individual, competition, training for a specific profession, and indoctrination into a specific culture of harmony within and around the school premises for meaningful teaching and effective management of education.

System theory allows for this synergy to be generated because of the communication channels that are open in a properly functioning system. Huseh, Smale and Devaney (2004) maintains that synergy is the combined effect of a system working together where the combined result is greater or more powerful than that of the individual components. When feedback channels are used to effectively measure organisation progress and then the institutions adapts to those suggested changes, homeostasis is achieved in that organization. By utilizing systems theory in organizational communication, the school principal can adequately communicate directives to all segments of the school and this will facilitate timely accomplishment of educational aims and objectives. Systems theory has also been used in application to organizational communication. Organizations are systems that have many different members

and relationships within those members. All of the relationships within the subsystems of an organization are interdependent on each other and can directly affect the operation of the system. When an organizational system is functioning properly synergy is present. Systems theory opens up the thought process about the feedback channels and adaptation process. The educational system is in dear need of feedback; students' need feedback about their performance in school evaluation while teachers need feedback concerning their performance of educational obligations. The use of systems theory can be useful in providing this desired feedback to all the sectors of the schools system, so as to facilitate an overall development of the entire system.

System theory provides tools that enable individuals and society to analyze and take action upon a host of complex issues we now face. Many of these issues are addressed in science, technology, and society curricula. These issues include: resource depletions, environmental management, appropriate technology, population control, energy use, and building ecologically sustainable economics. The complexity and dynamics of these sorts of issues quickly overwhelm traditional school science curricula. System theory provides a framework in which these complex issues can be powerfully engaged and addressed.

Change is a central aspect of our experience of the world. System theory is aimed at providing a framework for engaging the dynamics of our world. Understanding change means being able to comprehend system transformation and evolution. The ability to conserve number, form, shape, pattern, mass, volume, and other specific properties are crucial to being able to come to grips with change. Change at the center of understanding the dynamics of systems. With this knowledge, educational administrators can adequately prepare alternatives that will be fallen back on it times of changes like changes in the financial fortunes of a school.

The ability to understand the world on more than one level is important for engaging complexity. We believe large and complex systems need to be analyzed at both the individual (micro) and collective (macro) levels. The ability to relate individual and aggregate behavior is crucial for understanding complexity. Insight requires shifting back and forth from the micro-level to the macro-level and back again. Neither level can be reduced to or fully explained without the other. System thinking articulates the tension between these levels and the need to engage both levels in constructing understanding. Utilizing this principles, managers of the educational system can put in places policies that will diffuse tension and friction among the components of the university system for effective management of education in Nigeria.

Criticisms of the Systems Theory

Although the system theory is in tandem with demands of effective management of organizations and precisely the educational institutions, system theory was criticized for the following reasons.

- i. Some people reject the systems theory because it is too mechanistic in its view of human beings. Such critics view the theory as dehumanizing when applied to social phenomena in that it consider human groups to be in some ways similar to machines.

- ii. The theory has been rejected on the ground that it views social phenomena as equivalent to natural phenomena. Meadow (2009) faulted the theory by writing that, it treated social systems as a conformity or annex of some natural laws of biology, geology and planetary. Meadow further argues that, social groups and psychological beings are intrinsically different from natural entities in that they are social constructions and can be change by the will and intent of participants. For example, teachers in a school system for no good excuse may indulge in deviant behaviors just to distinguish themselves and destabilize the school's equilibrium.
- iii. There is yet to be convincing empirical research on social phenomena to test the applicability of the system theory directly.

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