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Theoretical Underpinnings of Curriculum Change in Developing Economies: Is Complexity Theory the New Wine in Lewins' Old Wineskin?

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Abstract

As the winds of change sweep across the globe, the developing countries are experiencing turbulence in their education systems necessitating major changes in curriculum. However, these changes will not be successfully implemented without a proper understanding of the concept of curriculum, status and implications of theories of curriculum change, and the main problems of curriculum change in developing economies. The authors adopted desktop research to conceptualize the fore listed areas of concern. The literature which spanned from 1940s to date revealed that in the face of change the concept of curriculum is acquiring new meanings; curriculum change takes various meanings- innovation (for new curricular), development or reforms (for general changes); there is a sharp division between theoretical and empirical knowledge on curriculum change; While Complexity Theory and Lewin's Theory of Planned Change and are used in curriculum change, there are criticisms that where as the Theory of Planned Change is too rigid and unidirectional, Complexity Theory is too fluid and unpredictable; The debate on whether Complexity Theory is new wine in Lewin's old wineskin is inconclusive; Complexity Theory seem to be suitable in understanding the multifaceted problems of change in developing economies which include insufficient diffusion and dissemination of information, lack of material and human resource, management issues, and the syndrome of copying and pasting innovations from developed countries.

Keywords: Curriculum, Curriculum Change, Theories of Change, Complexity Theory, Theory of Planned Change, Developing Economies.

Introduction

More than ever before developing economies are now experiencing a proliferation of curriculum change triggered massive changes in all sectors of life including social, political, economic and technological realms. The unprecedented nature of the changes and globalization effects from developed countries have put insurmountable pressure on management of these changes, to the extent that the old models of management may not suffice. This paper which focused on desk top research explored Complexity Theory and Theory of Planned Change sought to understand the concept and scope of curriculum change, status of theories which inform curriculum change, key constructs of Lewins' theory of Planned Change and Complexity Theory, major criticisms and parallels of the two theories, the main problems of curriculum change in developing economies, and the implications of Complexity Theory in regard to management of curriculum change in developing economies. The following research questions guided the discussion;

1. What is the concept and scope of curriculum change?
2. What is the status of theories which inform curriculum change?
3. What are key constructs of Lewins' theory of Planned Change and Complexity Theory? What major criticisms do the two theories face?
4. Is complexity theory the new wine in Lewins' old wines' skin?
5. What are the main problems of curriculum Change in developing economies?
6. What are the implications of Complexity Theory in regard to management of curriculum change in developing economies?

The Concept and Scope of Curriculum Change

A comprehensive understanding of the concept of curriculum change is only possible after understanding what a curriculum is. Glatthorn (1987, pp. 1) defines curriculum as "the plans made for guiding learning in schools, usually represented in retrievable documents of several levels of generality, and the implementations of those plans in the classroom; those experiences take place in a learning environment that also influences what is learnt". Arguments surrounding curriculum change has yielded other understandings of curriculum such as; (1) the ideal curriculum-what scholars believe should be taught; (2) the formal curriculum-what a monitoring agency such as the state mandates; (3) the perceived curriculum-what teachers say they are teaching in response to students; (4) the operational curriculum- what local supervisors, parents and other observers see being taught in classrooms; (5) the experiential curriculum-which includes learners interests ,abilities, learning styles and prior experiences (Goodlad et al., 1979).

Curriculum change is known by other terminologies such as educational reforms, development and innovation. Where as innovation refer to the introduction of completely new curriculum aspects, development and reform implies a general improvement of what is already there (Fullan & Pomfret, 1977; Fullan, 1982; Fullan, 2007). Since education is a major tool shaping the society, there will never be a perfect curriculum for all ages for the simple reason that the society continues to change from time to time (Shiundu & Omulando, 1992; Otunga et al., 2011). According to Otunga et al (2011) curriculum change can occur at three levels namely; minor, medium and major. Minor changes may comprise of re-arrangement of the sequence of the subject content or learning activities or just the addition of one topic or

method to the instructional program. Medium changes may include an innovation like integration of subjects, a new subject or a new approach to the existing subject. Major changes will affect many aspects of the curriculum, for example content, methods, approaches, materials; subtracting or adding to what already exists. There could also be changes in the conceptual design and organization calling for new planning.

The Status of Theories that Inform Curriculum Change

Modern curriculum is characterized by a sharp division between theoretical and empirical knowledge, yet the two are supposed to be inseparable. In Mutual courtesy empirical knowledge and theoretical knowledge are expected to inform each other, especially in the case of curriculum change. Theories play the role of midwifery and godfather as they imbue the instruments of empirical research and also inform the educational world affected by curriculum change. To this extent the importance of investigating the status of theories guiding curriculum change cannot be underrated (Schmenner & Swink, 1997). It is not a secret that over the past five decades educators are concerned with the question on why a majority of well intended curriculum innovations end up with a flop. Rogers identifies a total of ten such traditions, comprising over 3,000 research studies, drawing attention to theories on management of change in curriculum (Rodgers, 1962; Eichholz, & Rodgers, 1964).

The earliest recorded research in management of change in curriculum in the 1970's borrowed heavily from theories outside education, and since then there have been proposals and counter proposals about the best strategies, models and theories of curriculum change management ranging from the traditional- Tyler model to the more recent complexity theory; none of which is really satisfying the educators quest for effective management of curriculum change (Fullan, 1972; Fullan & Pomfret, 1977; Fullan, 1982; Fullan, 2007; Carles, 2002; Morrison, 2003; Smith, 2004; Pasi, 2012; Otunga et al., 2011). With more complex educational changes in the 21st century one wonders whether the old theories which have informed curriculum change will suffice. In essence; is the new wine going to hold in the old wines' skin? (Mark 2:22). At the turn of the millennium a debate ensued to chastise Lewin's theory of change over Complexity Theory, but barely succeeded as two years later further criticisms ensued (Burnes, 2004; Keth, 2006).

Lewin's Theory of Planned Change: Main Constructs

Lewin's (1947) Theory of Planned Change was the earliest model that was used to guide organizational change. It focuses on four elements that guide change namely; field theory, group dynamics, action research and 3-step model of change.

The field theory: emphasizes the importance of understanding change by mapping out the totality and complexity of the field in which it occurs. The field represents the environment in respect to the people or groups therein and the totality of coexisting factors which are conceived as mutually inter-independent.

Group dynamics: are defined as forces operating in the group. Lewin (1947) advised that in order to understand behavior that is related to change the whole psychological field "life space" must be studied in its totality and complexity (Burnes, 2004). The field is considered to be in a continuous state of adaptation called "quasi-stationary equilibrium", thus change and constancy are seen as relative concepts because the group life is never without change. The forces of change that impinge on the group cause fluctuation in the seemingly rhythm and patterns of behavior and processes observed; and for the group to survive its members have to engage in self-reorganizing activities. When change comes it is important to identify,

plot and establish the potency of the field forces, to understand individual, group and organization responses.

The force field analysis is a management tool that considers the forces facilitating (driving) and those restraining change, with the object of identifying and solving the problems associated with change. Effective management of change requires the change managers to balance the two opposing forces by employing appropriate strategies that enable them to shift the balance in the direction of the planned change in a 3-step model (Lewin, 1947).

3-Step Model to Change

As shown in Figure 1 below the 3-step model to change has three main steps; unfreeze, transition and refreeze. Taken literally If one has a large cube of ice, but realize that what he wants is a cone of ice, First he has to melt the ice to make it amenable to change (unfreeze). After which the iced water is molded into the desired shape then solidified into the new shape (refreeze) (Thompson, 2013).

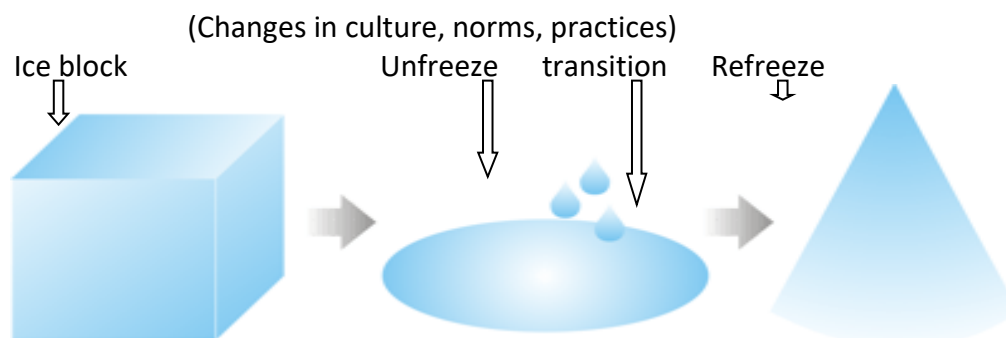


Figure1. Kurt Lewin 3-Step Model of Change: Adopted from Thompson (2013)

Unfreezing means shifting the equilibrium by increasing the forces driving change; that direct the behavior from the existing situation and decreasing the restraining forces that negatively affect the movement from the existing equilibrium or using a combination of the two strategies. The restraining forces can be reduced by presenting a provocative aspect of the situation to get people to recognize the need for change, educating them on the pressure for change- showing them the gap between current and desired change, while building trust and encouraging active participation in recognition of problems and brainstorming for solutions. What needs to come out clearly is; “the- who, what, where, how and why of the change”. If this stage is not handled carefully, then change is likely to be resisted. Successful transition is characterized by changes in culture, norms and practices (Lewin, 1947; Kritsonis, 2005).

The second step – transition means moving the target system to a new level of equilibrium. Three actions that can assist in the transition include persuading recipients of change to accept that change is necessary and getting them involved in the quest for the new. At this stage Lewin recommends group involvement in self-reorganizing activities through action research to bring to view measurements and milestones as some benefits of change begin to accrue (Lewin, 1947). The third step, refreezing, occurs after change has been implemented. Its main purpose is to stabilize the new equilibrium resulting from the change by balancing both the driving and restraining forces. Kritsonis (2005) refers to this final stage as one of crystallizing and adaptation of ownership of the new change. He predicts that if this step is not taken the change will be short lived and the system will get back to the old

practices. One action that can be used to implement this step is to reinforce the new patterns and institutionalize them through formal and informal monitoring mechanisms that involve rules, policies and procedures.

Complexity Theory: Main Constructs

Complexity theory is popularly used to explain change, evolution and adaptation. It is a revolt against the cause and effect models of linear predictability. It depicts an organization as an organism which must sense and respond to its environment thereby getting changed and in reaction -proactively changes its environment, thus producing dynamic and continuous change recursively. It is actually a theory of activity, pro-activity and reactivity requiring a collective and relationship among the member parts. The theory contends that complex systems scan and sense the external environment for changes and make internal adjustments and developments in order to survive. Survival requires change, disequilibrium and unpredictability and these functions involve self-organization; spiked by the systems own auto catalyst operations that helps it to demonstrate 'autopoiesis' - unique nature and identity (Morrison, 2008).

This differentiation is what gives the organization the niche for survival in the competitive environment. Further survival requires the system to do a balancing act in its operations; thus balance cooperation with competition, similarity with difference, individuality with collectiveness, connectedness with separation, necessary deviance with necessary conformity, diversity with uniformity, partial predictability with partial unpredictability (Morisson, 2008). Self organization is characterized by adaptability, open links, learning, feedback, communication and emergence. The process of emergence comes about through self-organized criticality, and is directed by simple rules between the organism and its environment. Creative emergence requires a process of change, determined partially by the need to survive and is a process characterized by increasing connectivity, networking and feedback (Stacey, 2002).

Non-linear and self reorganizing systems operate at the edge of chaos and disorder as they respond to environmental changes.

While chaos may seem to be randomness, complexity theorists see an underlying order that emerges through self reorganizing. Order is not forced by external forces it emerges. Referring to Stacy (2003), Burnes (2004) states three types of order which organizations experience as (1) stable equilibrium (2) explosive instability and (3) bounded stability. Under these conditions "systems have the ability to transform themselves in order to survive"; that is "if the systems become too stable they ossify and die. If they become too unstable as with cancer they may get out of control and destroy themselves".

Therefore instead of a stable equilibrium, adaptive systems keep changing continuously settling for the poetically safe zone termed as the "edge of chaos". Systems which have appropriate order generating rules or are able to create new ones if the old ones can no longer cope with the changes in the systems environment will experience relative order amidst limited chaos that come with changes in environmental conditions (MacIntosh, & MacLean, cited in Brunnes, 2004). The main constructs for Complexity theory are self organization, complex adaptive systems, nonlinear change, emergence, unpredictability, diversity, differentiation, and autopoeisis, networks, connectivity and relations, order without control, feedback, open systems, collectivity, distributed knowledge, autocatalysis, holism and co-evolution.

As pointed out by Brunnes (2004); Sarayreh and Khudair (2013) regarding complexity theory, there are three implications in this theory. First, there is a greater need for democracy and power equalization in all aspects of organizational life, especially greater participation of stakeholders in change. Second, small incremental and large scale change should be rejected in favor of continuous change based on self-reorganization of the group. Third, in achieving effective change, order generating rules have the potential to overcome the limitations of rational, linear, top-down strategy driven approaches to change. Briefly, Complexity theory seems to suggest that (1) organizations with greater consideration for the process of change are more effective in management of change (2) organizations with greater involvement of stakeholders in the process of change manage change more effectively than those without such level of involvement (3) organizations with formulated strategies for implementation of change are more effective in managing change than those without such strategies.

Criticisms of Complexity Theory and Kurt Lewins'

Theory of Planned Change

Complexity Theory

Some critics have argued that Complexity Theory is potentially dangerous for the school system, especially its element of unpredictability. They reason that in educational system where there is responsibility for what happens and accountability for what is planned giving room for the theory is tantamount to inefficiency. Further, Yvone (2010) points out that the putative disadvantages of Complexity Theory - being non-optimal (no efficiency), non-controllable (absence of authority), non-understandable (causality is multidirectional); non-immediate (complex systems take time to boot up); does not augur well with the political education policy makers who desire efficiency, control, comprehensibility and immediate solutions. She further contends that Complexity theory is too pragmatist and relativist, thus takes care of only what works. Even though most of its central elements are mutually reinforcing and mutually potentiating it is not coherent and could essentially be epistemologically contradicting.

Theory of Planned Change

According to Sarayreh and Khudair (2013), critics of Theory of planned Change have argued that Lewin's planned approach is based on "a static, simplistic and mechanistic view of organizational life". His 3- step model has, especially, been criticized for being too simple and linear to help in understanding change in the often complex organization settings. However, in defense of Lewin et al (2013, pp.628) argue that "models are simplifications of phenomena that serve to create our images of how the world works. Since all models are simplifications, they are all inaccurate to some extent. The most important aspect we need track is whether or not they are useful". The duo with a hang over from "Lewin's tot" point out that the theory of Planned Change has contributed significantly in restoring order, which is an essential characteristic of any sober organization.

Is Complexity Theory the New Wine in Lewins' old Wine Skin?

"No man putteth new wine in old wineskin" Mark 2:22. This warning concerns two parallel teachings that were going on during the New Testament times; the gospel and the pharisaic teachings- the later condemned for its rigidity. The interpretation is that the new wine would burst the old wineskin because of its potency. In the context of this paper two meanings are derived. First, Complexity Theory is not completely a new theory it has just been

packaged in Lewin's old wineskin – bearing similar ingredients though with a new label (Sarayreh & Khudair, 2013). Secondly, Complexity Theory could be more potent than Lewin's Planned Change Theory- no wonder the fear that the skin could burst.

Scholars who support the first interpretation claim that Complexity Theory has borrowed a lot from Lewin's Theory of Planned Change. For example the four elements of The Theory of Planned Change (1) field theory (2) group dynamics (3) action research and (4) 3-step model of change, are said to be disguised in Complexity Theory under different terms. The field is paralleled to the complex environment of change, group dynamics to collective and relational relationships among group members, action research to self-organizing-criticality

(Lewin, 1947; Burnes, 2004; Sarayreh & Khudair, 2013). However, the tide changes with the 3 Step- Model - un-freeze, transition and refreeze. Where as this alignment depicts linearity of action, Complex Theory advances that for successful change and survival of a system, there has to be disequilibrium and unpredictability; that when a system refreezes it will be operating at a dangerous zone. The best zone is that of chaos. A system is most creative and innovative at the edge of chaos. Thus far Complexity Theory displays a characteristic that is completely different from Lewin's instrumental rational- linear mentality to change and perhaps bottles itself in its own wine skin.

Added to this new brand is the ingredient of emergences. Unlike Lewin's Theory of Planned Change, Complexity Theory takes into consideration the complex nature of organizational change in terms of its content and context which are prone to emergences during implementation. While Lewin focuses on only the planned objectives and the outcome of change, Complexity Theory gives emphasis to the process of change, particularly the emerging outcomes-the unexpected (which is a typical reality of change situation)- see figure 2 below. Its tendency of understanding change in a bottom up fashion is totally a new phenomenon in curriculum innovation of developing countries, where top-down Lewinian-Tylerian practices have prevailed. Added to these features, what makes Complexity Theory unique is its emphasis on collaboration and communication in change implementation (Stacey, 2002).

Problems of Curriculum Change in Developing Economies

There is quite some literature of curriculum innovations in developing countries (Shiundu & Omulando, 1992; Schmenner & Swink, 1997; Otunga et al., 2011), mostly adoptions of ideal science education systems from developed countries. Following the curriculum reform movements in the developed countries in the 1960s, there was a proliferation of curriculum developments in developing countries in 1970s. The developed countries' curricula were used as a basis for reform; thus adoptions of what were believed to be "good practice". Lewin refers to the case of Lesotho (as cited by Sarayreh & Khudair, 2013). Into the 1990s and the millennium thematic research on change has spread from developed countries to developing economies (Norris & Charles, 1991) ; some volumes of abstracts on effective schools were found in the curriculum laboratory of the University of Eastern Africa Baraton in Kenya.

If problems of curriculum change exist even in developed countries like the United States of America with highly skilled, supposedly motivated and dedicated teachers who continuously receive professional development and support in form of physical resources, implementation of innovations are most likely to be cumbersome in developing economies which lack physical infrastructure and experienced professionals. Some of the registered

concerns about curriculum innovations in developing economies have been insufficient diffusion and dissemination of information on innovation, not knowing how best to put change in practice, how to cope with the demands of innovation, effects of change on clients, how to collaborate with colleagues during implementation, and how to improve on the innovation. These problems stem from the inception of innovations as that there is little effort put in studying their feasibility, appropriateness or sustainability in the context of developing economies. In most cases they are superficially adopted and do not live up to the expectations of the reformers (Montero-sieburth, 1992).

One of such failures occurred in Botswana where a new model for learner centered curriculum was introduced to replace teacher centered approach. Instead of the new picking up, the curriculum was still dominated by the bureaucratic, authoritative teacher centered approach. The interactive flexible methods could not survive with the deeply rooted teacher centered tradition that had been rubberstamped by the colonial government. In a similar venture in Nigeria failure of innovations was blamed to foreign language barriers, inadequate resources, and inadequate training of teachers to meet the needs of the innovation. In a separate study examination papers from eight countries were still dominated by recall questions in spite a new curriculum which was stressing on affective outcomes. In addition, the top-down management approach to curriculum change in developing economies makes it repulsive to recipients. Being mainly large scale, and national initiatives; the innovations are imposed from top by a small group of specialists.

(<http://wiredspace.wits.ac.za/bitstream/handle/10539/5908/Chapter%202.pdf?sequence=12>).

Lewin (1992) gives an example of Lesotho where an innovation was initiated by a small team of ambitious science panel members from the national curriculum development center and a few members from the education sectors. Such a bureaucratically structured system would tend to be far removed from the realities of most class rooms in developing countries as they require skilled trained teachers who in essence do not exist in real situations (Monter-sieburth, 1992; Fullan & Promfret, 1997). Research from South Africa indicate that the implementation of the new "Curriculum 2005" in 1997, shortly after independence, was highly ambitious and a mismatch of the realities on the ground. The reform focus on "Outcomes Based education" (OBE) was criticized in the following ways (1) language used being too complex; (2) pausing exaggerated claims on how education could revamp the economy; (3) fronting flawed assumptions about what will happen inside schools; (4) specifying outcomes hinders democratic learning; (5) politically and epistemologically undermining the African National Congress politics that were based on "process" not outcomes ; (6) side stepping the important issue of values in the curriculum (7) creating administrative burden on teachers; (8) OBE trivializes and fragments curriculum content; (9) would require re-engineering of education system and potent mechanisms in schools (Jansen, 1998; Ndou, 2008).

A comprehensive research on models and practice of curriculum change in developing countries by Monter-sieburth (1992) revealed that most of these countries have a centralized education system; and use a center periphery approach in curriculum change implementation. This approach cuts off teachers and community members who are main sources of curriculum development. Citing Mebrahtu (1984, pp.163); Monter-sieburth (1992) writes "curriculum is viewed as too important to be left to school teachers. By and large teachers are rarely involved in planning a course, nor are their views on why or how to change the curriculum genuinely sought after". He adds that "in developing countries the use of

categories such as rural and urban obscures the community's role in education. Curricular changes are unlikely to succeed unless they are social and academic activities in which parents are encouraged to participate".

Implications of Complexity Theory for Curriculum Change In Developing Economies

Morrison (2006) referring to a paper presented by Tong (2006) reports a case where Complexity Theory was used to inform high level change in English department in a Hong kong school. In this case, an external change agent worked with the recipients to bring about the emergent change. This is an example of externally facilitated, bottom up change and development through internal feedback and openness; the task of the agents was to create conditions for self organization rather than to provide the exact blue print or specific detailed content of change. As Morrison remarks "that task is to be less like a Napoleon, concerned with tiny details, and more like Churchill, concerned with the bigger picture and overall direction" (Morrison, 2006, pp.4). Citing another study carried out by Noruiga (2006) in nursing education in Macau, Morrison (2006) presents a more macroscopic view of change; in this case the pressure for change led to both networking with external nurse training providers and making greater changes in nursing education. This venture required the use of the law of requisite variety that says that "internal systems, flexibility change and capability must be as powerful and diverse as those in the external environment" in order for a system to survive (Morrison, 2006, pp.5). This restructuring had to take place through self-organization.

Following the expansion of gaming industry in Macau, Tchiang (2006) studied the impact of massive changes in the economic sector on schools. Reportedly, the huge expansion was leading to teacher attrition and fall out on parental involvement. Borrowing from Complexity Theory a critical need for increased communication and networking for Macao schools was recommended to open up avenues to the traditionally closed up schools. It was noted that the schools were closed up from outside influences and communication, and this had to change. However, there is caution that the move towards greater openness and communication advocated by Complexity Theory had to be advanced with care so that schools are not rendered too responsive just because of emergent economic imperatives. Furthermore, it was noted that many of the schools have no preparedness for openness. In a separate study of change in Macau's curriculum Fong (2006) suggests that the multi-level, multi-dimensional, multifaceted, multi-agent and multi-perspectival nature of Macaus' government's curriculum reforms can best be met by flexible curriculum development and management strategies, and there have to be internal changes within the school.

On the overall there is greater conviction that Complexity theory will offer the opportunity to resurrect educational topics in developing economies that have been suppressed by the long periods of colonial and neo-colonial high controls in education, heavy prescription and mandated contents, reinforced by high stakes assessment systems and constant surveillance. The theory, indeed, redefines the basics of education based on an interdisciplinary, emergent and constructivism curriculum and resurgent of freedom as the backbone of education away from a controlled and a controlling subject based education – away from "the neatly stated, over-determined, tidy, traditional, Tylerian, externally mandated and regulated prescriptions of governments for the aims, content, pedagogy and assessment of learning and education" (Morrison, 2006, PP. 5). Complexity theory accounts

for the position of higher education in developing economies as they respond to a marketwise-globalized economy (Yvone, 2010).

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