

Teacher Education Systems in Africa in the Digital Era



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Teacher Education Systems in Africa in the Digital Era

Edited by
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and
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Council for the Development of Social Science Research in Africa
DAKAR

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Preface

What ends should teacher education serve? What is the role of teachers in the effort to realise those ends? What are the major challenges facing African society in the digital age and how can teacher education be structured to meet those challenges? These are some of the recurring questions in African education today. To argue that teacher education is strategic or important in any society is, indeed, to say the obvious. But that cannot be the end of the argument as any national educational policy, as well as its implementation in any education system, is pivoted by the quality of teachers and teacher education within that system. It is the product of teachers and the education system that dictates the economy of any nation. Models and frames of teachers' professional development, school management board, education for all and even the millennium development goals revolve around the frames of teacher education. Several issues on teacher education exist in literature but recurring is the word 'quality' within the concept of indigenous knowledge, knowledge explosion and knowledge economy.

Again, many nations have no substantive baseline data on their teacher education system, especially those that inform practices on the job. Establishing teacher education institutions for excellence can be the beginning of quality for many other institutions, and education in general. However, more is demanded of the teacher educator in the digital age as obsolescence seems to glamour the existing classrooms. To survive in a globalized world, every teacher needs some basic survival skills, which include the ability to reason, the ability to readjust one's own terms to cultural flux and the ability to control and spend one's uniqueness while participating harmoniously in the new modernity.

It is also important to note that a functional teacher education in Africa can help its citizens explore the networking of the world as a global village. This is achievable through a systematic mobilization of our national resources and a modernized cadre of scientific and technological manpower. Teacher education therefore needs to equip our teachers at all levels to be capable of self-learning. This will make them not only consumers of information but also creators, originators and inventors of information. The belief is that the more we are able to reflect on prescribed goals, the more we are not likely to be exploited,

manipulated economically, socially and even culturally. Teacher education at this level serves as a link between the unpredictable world in which man lives and the tools to cope with the numerous challenges created by the digital age, otherwise known as globalization.

However, it can be explained that the extraordinary changes brought about by ICT in all facets of human endeavour make it imperative that similar changes be brought into the school system, and the first place to start this revolution is the teacher education institutions. Teacher trainees need to be taught how to take advantage of the dynamism of the digital age, to demonstrate and demystify some difficult-to-understand concepts, theories and principles. This will make the classroom livelier, with learners being more creative and actively engaged in effective learning.

Given the laudable impact of ICT on teaching and learning, it becomes necessary that both teachers in training and those in-service become knowledgeable about the use of relevant digital skills to support their teaching. No teacher can survive this modern trend without at least a foundational or elementary knowledge of ICT. The teachers will become unproductive and obsolete if they are not rich in ICT knowledge. They may find it difficult to access information or teach current findings in their subject areas. There is therefore the need for teachers to be exposed to basic training on the use of ICT in pedagogy.

It should be emphasized, however, that the benefit of using ICT to students is greatly dependent on the skill of the teacher and the teacher's attitude to the introduction of such skills in teaching. Hence, this book is entitled *Teacher Education Systems in Africa in the Digital Era*. It is a culmination of theories and practices for the benefit of teachers in the classrooms, teacher trainers, policy makers, funding agencies and other stakeholders. Although the ideas expressed in each of the chapters are entirely those of the authors, the issues and depth of analyses are quite impressive. Overall, the common stand that cuts across the chapters seems to be that teacher education in Africa needs to be refocused to adequately face the challenges of digital age, and that teachers need strategic digital skills to make teaching and learning in African classrooms meet the demand of the new age.

1

Introduction

Adesoji Oni

The issue of teacher education in Africa is indeed critical in influencing any reforms in the education sector. The authors reiterate this point when they assert that the quality of any education system is as good as the quality of its teachers. They further examine the fundamental reforms in teacher education in Africa, with examples drawn from East Africa, Nigeria and South Africa in particular, but other countries as well. Their position is that teachers are products of a professional socialisation system, which determines their effectiveness, to a large extent. The subject is important in helping educationists to re-examine teacher-related challenges that Africa's education systems are facing.

The authors equally have a very strong argument on the need for teachers and teacher educators to adopt new technologies. If this is not done, then little will be expected of an African teacher whose relevance will rapidly fade away. The most important skill for the teacher is how to guide the learner to access and decipher information that is considered important for whatever issues are being studied, i.e. the process of information gathering and processing into meaningful knowledge.

This book will definitely be of interest to prospective teachers, on-service and in-service teachers, teacher educators and policymakers on issues of teacher education. It will enable them to begin the process of introspection about the way teachers are educated and trained in the digital era. With the advent of the digital era, Africa has been forced to make decisions that will either enable it to catch up or remain behind other countries.

This book highlights several issues of teacher education in Africa in eighteen chapters, each of which will be summarised in this introduction.

Re-profiling the Teacher and Teacher Education

This chapter addresses fundamental issues in educational reform, and a series of factors acting as pivotal points are discussed. Pai Obanya, a retired professor of education, discusses the issue of the teacher factor as one to contend with in reforming education, spelling out paradigmatic shifts on what constitutes a real teacher, what certificate is possessed by the so-called qualified teacher, what pedagogical training has been acquired by the teacher and the level of positive transformation the teacher has had on students.

The chapter equally examines how educational reforms are the insistent aspirations and cravings for reform based on the changing world which is hinged on three major phenomena: globalization, information and communication technologies (ICT) revolution and the knowledge economy with its seven major characteristics. This chapter discusses the need, requirement, implications and curriculum of initial teacher education and also provides an overview of the development of continuing professional education with major emphasis on professional preparation of the teacher education in line with the learning pyramid in diagrammatic form.

Finally, the chapter clarifies the contemporary trends of education and their implications; levels of re-profiling present-day teachers in some contexts, such as the qualities of a good teacher; skill packages of today's teacher; and, the pedagogical profile of a contemporary teacher with some paradigm shifts.

Policy Issues in Teacher Education

This chapter is on the issues that have guided the development and practice of Teacher Education in Nigeria. The authors, Titilayo Dickson Baiyelo and Catherine Oke of the University of Lagos, Nigeria, begin by attempting to operationally define and explain the key concepts – policy, issues and teacher education – showing the relationship between them. In the process, the procedures which lead to the formulation of a policy are chronologically outlined from the problem/ issue and investigation stages to the recommendation and legitimization stages. Linking the historical origin of policy formulation in Teacher Education to educational policies in both the pre-colonial and colonial eras, the chapter enumerates a good number of commissions, constitutions and publications that have directly or indirectly conveyed elements of policy-making concerning teacher education in Nigeria.

Thereafter, the position of the Federal Government of Nigeria on teacher education, as contained in the National Policy on Education (FRN 2004), is elaborately addressed and, in so doing, the goals of teacher education in Nigeria as well as the various institutions responsible for providing teacher education are highlighted. Major areas of emphasis in the policy which concern these institutions, such as the recruitment of staff, admission guidelines, course content, teaching

practice, certification and licensing are then discussed. In addition, the scope of teacher education is properly defined.

Furthermore, outstanding issues challenging the effectiveness of teacher education in Nigeria are explored. The duration of courses, the requirement for professional teachers' registration, threats to capacity building in colleges of education, the inefficient media employed to combat the aversion of the teaching profession as well as low enrolment rates are all among these issues.

Mapping Teacher Education Institutions for Excellence

In their chapter on 'Mapping Teacher Education Institutions for Excellence', Fabiyi Anne and Sule Seidu of the University of Lagos, Nigeria, posit that at present, the teaching profession is faced with the challenges of excellence, revitalization and professionalism. For the twenty-first century teacher to be relevant in this age, a well planned training programme is essential. This chapter discusses functional education which plays a pivotal role in the production of citizens that would turn things around for good. The adoption of teacher education institution mapping is required for excellence and ensures a significant change in the method of planning and implementation of education.

The chapter highlights the institutions that have been saddled with the responsibility of providing balanced training for teachers in a professional manner. The training institutions across the federation should adopt teacher education institution mapping. The personnel that will prepare and implement the school map should be well trained. The authors argue that school mapping is a veritable tool for setting up a school programme that will adequately meet the future educational needs of the people.

The chapter summarizes the challenges to effective teacher education mapping, ranging from inadequately trained personnel to corruption, and concludes with the strategies for resolving the challenges.

Teacher Education in Open and Distance Universities in Africa

Adams Onuka of the University of Ibadan, Nigeria, in his chapter titled 'Teacher Education in Open and Distance Universities in Africa' submits that open and distance education plays a vital role in reducing the gap between the formal mode of education and its accessibility. It bridges the gap by providing a handy opportunity and a substitute to the actual formal education system carried out within the four walls of a definite formal school setting, with the aid of virtual tutors. This chapter points out the distinctions between the two terms – Open Learning and Distance Learning – which are most often used interchangeably but with different meanings. While Distance learning centres on time and space as major factors, Open learning concerns itself with availability of teaching/learning

materials. This work also points out the widely accepted reception of Open and Distance learning as specified in the Nigerian National Policy on Education.

The chapter also examines some practical issues such as Open/Distance learning marketability in the recent world of current knowledge commoditization, availability of self-explanatory and formidable learning materials, application of modern ICT facilities, application of contemporary evaluation technologies in Open and Distance learning, effective management of Open and Distance learning, provision of support and counselling services, admission process, record management and client services, among others. Furthermore, the chapter delves into the various ways of carrying out inter-Open/Distance learning programmes such as training, material development technology, common workshops, joint conferences, joint professional associations, ICT facilities and a host of others, while concurrently pointing out the various benefits associated with the collaboration exercises, such as building of mass ICT centres, library services, provision of unwavering power supplies and lots more.

In addition, this chapter accentuates on the relevance of the constructivism theory of teacher education, whose underlying principle of electronic media compliance perfectly matches the Distance learning mode of teacher education. In summary, this chapter discusses the principles involved in Open/Distance learning, teachers' preparation as a tool for quality marketability, and synergy as a way of maximizing the benefits of Open/Distance learning.

Teacher Education in South Africa: Issues and Challenges

In this chapter, M.B. Ogunbiyi and E. Mushayikwa of the University of the Western Cape, South Africa, critically examine the impact of the changes that have taken place in the South African education system in order to understand the challenges faced by teacher education in South Africa. To do this, the writers divide the stages of education reform into three, namely: the colonial era (1800s-1940s), apartheid era (1950s-1994) and from the beginning of the democratic era in 1994. During these periods, changes in the educational system have impacted greatly on the teacher education system in South Africa. Unfortunately, in the beginning, changes which are supposed to reflect societal hopes, aspirations, values and norms were constructed upon the whims and caprices of the ruling class. This is why the educational system of the apartheid regime was based on the principle of segregation and racism with its product that depicted the discrimination between white and black. However, the post-independence government redressed this educational imbalance by granting equal opportunities to all South African learners to pursue their intellectual interests. The major aspects of educational policies in the South African post-independence era are: the establishment of a single Ministry of Education which classifies all higher education and training institutions under the same educational system 'to ensure unity of

purpose and standards across the sector', the development and establishment of a National Qualifications Framework (NQF) which has a particular transformative purpose as reflected in its five objectives. Others are the merging of education and training institutions together and the introduction of a new educational curriculum with constructivist philosophy. The impacts of the change in the policy of the South African education system include opportunities for teachers to upgrade themselves and the creation of incentives for professional development, among others.

The Delivery System in Teacher Education

In this chapter, Kayode Ajayi and Adeyinka Adeniyi of Olabisi Onabanjo University, Ago-Iwoye, Nigeria, argue that teacher education takes centre-stage in Africa and most especially in Nigeria today. The authors highlight the various skills that are important in equipping teachers to deliver as the best professionals in the classroom.

The chapter takes a critical look at effective delivery system in teacher education. In this era of globalization, digital technology holds sway. In order to compete effectively with the rest of the advanced world in terms of teacher education, there is need to take advantage of the technological gadgets and other facilities it offers.

Technology makes teaching a lot easier. It offers a number of education media that are useful in effective delivery of teacher education, as the quality of a nation's teachers presupposes the quality of its educational system, which in turn presupposes the nation's quality. In conclusion, the authors posit that attention must be directed at providing modern equipment and trained personnel, especially at the primary and secondary levels of education in Nigeria. This will boost our educational development and place the education system at par with the very best in quality and standards anywhere in the world.

The Delivery System in Teacher Education in Nigeria: Traditional Practices and New Paradigms

More about the issue of delivery system in teacher education may be found in this chapter, written by Simeon Dosunmu. According to the author, education is accepted all over the world as a process of transmitting cultural heritage, stabilizing the present and improving the future. It also provides interaction between the students and the teachers on subject-matters. The history and roles of teacher education are also discussed. This chapter equally enumerates some goals of teacher education as (a) Producing highly motivated, conscientious and efficient classroom teachers for all levels of our educational system; (b) Encouraging the spirit of enquiry and creativity in teachers; (c) Helping teachers fit into the social life of the community and the society at large and be committed to national

goals; and (d) Enhancing teachers' commitment to the teaching profession. This chapter also examines some issues to be taken into consideration in finding the way forward, such as, creating a learning environment that promotes active learning, critical thinking, collaborative learning and knowledge creation.

Sociological Perspectives for Skills Development in Teacher Education

This chapter by Adesoji Oni and Titilayo Soji-Oni opens with an exposition on the major concerns of Sociology and the application of the discipline to education, pointing out the central place of the latter in societal or national development; and showing that since education performs such an important function, then teacher education is necessarily a focal point as far as national development is concerned. This is because adequately trained and motivated teachers who are dedicated and loyal are indispensable to the success of any educational system.

The authors define teacher education in the light of the goals it seeks to achieve, and spells out the need for it to be reviewed in consonance with the competitive demands of the digital world. In addition, the roles of teachers from a sociological point of view are examined. Specifically, two broad perspectives on this issue are discussed – the theories which put the teacher in a conflict situation by holding that teachers are political weapons for perpetrating oppression in society (the reproduction function) or that they are agents of social and cultural transformations (the productive theory); as well as the position of the structural functionalists in which teachers are seen as part of a skilled labour force that prepares learners for unequal social stratification in order to maintain the capitalist appropriation of profit.

The benefits of providing digital empowerment for teachers and the challenges that bedevil skill development in the digital era with specific reference to the African continent are discussed. Finally, the evidence in knowledge, morality and technology as important skills for teachers to acquire and utilize is explicated and the chapter closes with the argument that African teachers must become self-directing professionals if they must wield any political influence and contribute meaningfully to social change in this digital era.

Counselling Perspective for Skills Development in Teacher Education

The thrust of this chapter by A. A. Sulaiman of Lagos State University, Nigeria, is that the teaching of counselling skills and techniques to prospective teachers should not be limited to how these may be used to help children and their parents but should be extended to how they can be constantly employed in the classroom. Thus, after emphasizing the need for education to develop the whole child in terms of the affective, cognitive and psychomotor domains, and after lamenting

the fact that educational stakeholders have continuously restricted the learning process to the development of the child's mental aspect, to the gradual neglect of the affective and psychomotor aspects, the chapter provides insights into a wide range of counselling skills and techniques that can be used by teachers in everyday classroom activities.

The concepts of counselling, skill and technique are explained in the chapter. Then Listening, Questioning, Summary, Solution-Focus, Rapport, Empathy, Role Playing, Shaping, Chaining, Prompting, Reinforcement, Token Economy, Punishment, Extinction, Assertive Therapy, Self-control Therapy and Cognitive Restructuring are discussed as techniques and skills that should form part of a teacher's methods of instruction and relations with students in the classroom. In conclusion, it is conceded that teachers are certainly not trained counsellors and hence cannot truly act in such capacity. However, these skills will be of assistance in classroom teaching and in ensuring that all types of learning take place considering the fact that guidance counsellors are not readily available in many schools.

ICT and Teacher Education in East Africa

Olukayode Emmanuel Fagbamiye of Kampala International University, Uganda, discusses the relevance of teachers in East Africa in relation to ICT. According to him, teachers will remain relevant and cannot be displaced by technology, no matter its innovations. Even when new technologies are introduced, the effectiveness of their use will depend on the knowledge and the skill of individual teachers to integrate them into the teaching-learning process. Teaching as a profession in many countries is a product of the last 100 years with different practices through the ages. Most of the time, teachers are poorly remunerated – with the consolatory assertion that their reward is in heaven. The profession is usually populated by females who are found at the lower levels of education while the males populate the higher levels. In this age, teachers are generally better educated and more militant, but the question of comparatively low salaries persists in African countries and will continue as long as the nations' populations remain youthful with a high dependency ratio. Quoting Ryan and Cooper (1996), the author observes that the use of technology in the classroom is gaining increased attention as an issue in education, but there is the need to equip teachers with these ICT skills and bring the skills to bear on the teaching-learning process. Definitely, help would be needed from various sources before teacher trainees and serving teachers are equipped with the know-how to integrate ICTs into the teaching-learning process in schools in this sub-region.

Resistance to the use of new technology is real but it can be overcome if all stakeholders – school leaders and teachers – are jointly socialized and acculturized. The greatest challenge in the use of ICT in East Africa is going to be sustainable funding, which must be continuous and renewable, for the provision of infrastructure, computers, software and training of users.

Integrating Technology into Social Science Teacher Education

In this chapter, Biodun Ogunyemi and Alaba Agbatogun of Olabisi Onabanjo University, Ago Iwoye, Nigeria, explore the challenges of integrating technology into social science teacher education, in view of its philosophical and pedagogical foundations. Social science deals with social phenomena that are sometimes difficult to express, explain and describe effectively without the support of pictorial, graphic, audio and audio-visual materials and equipment. Technology-driven social science classrooms have a great potential of exposing the students to a myriad of academic opportunities to explain and understand these phenomena. Social science educators have advocated the integration of ICT within the spectrum of social science instruction. A learning environment complemented by the use of technology facilitates social interactivity and reflective community practice.

To effectively integrate technology into the teacher education programme, there is a need for practicable implementation plan that puts into consideration the actual instructional needs. Manson et al (2000) suggest the following principles: extend teaching beyond what could be done without technology; introduce technology in context; include opportunities for students to study relationship among science, technology and society; foster the development of the skills and knowledge necessary for students to participate as good citizens in a democratic society. The chapter concludes by enumerating the challenges for promoting successful technology integration and ways of tackling them.

Pedagogical Integration of Technology into Science, Technical and Vocational Education

More about the integration of technology may be found in this chapter by Blessing Adeoye of the University of Lagos, Nigeria. The chapter stresses the relevance of technology to the modern world vis-à-vis the need for technology integration into the educational system. It highlights what technology can do to advance the teaching-learning process.

Along with Dockstander (2008), the writer defines technology as the incorporation of technology resources and technology-based practices such as the computer, internet, e-learning, instructional media, etc., into the daily routines, work and management of schools, with greater emphasis on teaching. The author lists the benefits of technology as, *inter-alia*, the development in teachers, a strong desire for professionalism, skill and confidence in using technological tools and in increasing students' capacity for comprehension. Technological tools also serve as valuable sources of information, motivation and presentation. These factors, among numerous others, allow obvious and dramatic changes in classroom organization and management.

However, according to the writer, while the incorporation of technology into education exposes students to the concept of globalization, it faces some challenges. These include: lack of confidence, incompetence, inaccessibility of resources, negative attitudes and slow pedagogical thinking – all these on the part of the teachers. Others are insufficient funds and erratic power supply. In proffering solutions, the writer calls for the provision of ICT resources, sufficient time and technical support for teachers. Furthermore, the chapter mentions three learning theories related to technology integration, namely, behaviourism, cognitivism and constructivism. In conclusion, the writer observes that technology is now linked to the reform movement in education since it has proved to be a successful tool in the hands of educational reformers.

Teacher Education and Process Skills in the STS Classroom

In this chapter, Francis M. Isichei of the University of Lagos, Nigeria, considers teacher education from the perspective of science education, which has always articulated a need to have students develop their thinking and reasoning skills. There is a need to reform the way science is being taught in our schools. Students need to be taught science in a way that makes it more relevant and meaningful to them. In this digital age, technology – including digital technology – is seen as being very important. Science Technology Society (STS) has been called the current megatrend in science education (Roy 1984), and others have called it a paradigm for the field of science education (Hart and Robottom 1990). It is therefore the thinking that process skills enhancement in the STS classroom, with other skills such as critical thinking, education for critical thinking and action research in teacher education, would be worthwhile in Africa's educational system in the digital age.

Critical thinking is self-correcting. Turning the classroom into a community of inquiry, with moral and intellectual integrity, would enable students correct one another through inquiry. Critical thinking also displays sensitivity to context, and action research must be integrated into teacher education in Africa as elsewhere across the globe.

Obstacles to the Domestication of ICT in Humanities Education

Antonia Maduekwe of the University of Lagos, Nigeria, carried out a survey on the domestication of ICT in humanities education. Two research questions were raised in the study. The samples of the study were lecturers from four Nigerian universities, two from south western Nigeria and two from south eastern Nigeria. The study sees information and communication technology (ICT) as playing a significant role in the teaching-learning process. It is used to open new opportunities for progress, the exchange of knowledge, education and training and for the promotion of creativity and inter-cultural dialogue.

This chapter discusses the roles of ICT in higher education and reiterates that institutions across the world have been adopting ICT in an effort to create an environment for both learners and their instructors to engage in collaborative learning and gain access to information. It also examines the theory of domestication which was propounded by Chigona, Kayonago and Kausa (2010) who submit that domestication consists of three main processes, namely, commodification, appropriation and conservation. This chapter also discusses the perceived obstacles impinging on domesticating ICT in the pedagogy of humanity education in Nigeria universities.

The results of the study revealed that four major variables – power, economic, political and socio-economic factors – ranked highest and combined among the obstacles affecting lecturers’ domestication of ICT in humanities education. The chapter concludes by recommending that: to revamp the humanity system, there is need to produce a technologically literate workforce that is competent to rise up to the challenge of technological innovation. ICT must be given the necessary attention by institutions to ensure that it is integrated and domesticated into our educational system.

Curriculum Theorizing and Practice in Teacher Education

Bade Adegokge of the University of Lagos, Nigeria, affirms that a proper curriculum of teacher education should primarily focus on arriving at a competent and effective teaching-learning process. Based on this assumption, an advocacy for curriculum theorizing is stirred. This chapter attempts to define ‘curriculum theorizing and practice’ as that which provides answers to practical curriculum field of uniqueness and has its roots in Philosophy, Arts and Science. Also, some major pointers were exposed as fundamentals in the field of curriculum theory in teacher education. Accordingly, while expounding on curriculum planning, implementation and evaluation, this chapter discusses some domains mentioned by a few authors as noteworthy in terms of ideological and technical issues – especially the seven different traditions of curriculum research, namely: analytical, evaluative, interpretative, model, predictive and theoretical studies – while also spelling out three major paradigms dominating inquiries in today’s curriculum research.

Furthermore, this chapter outlines some roles of curriculum specialists since the conception of curriculum theory as a field and also the place of curriculum challenges in teacher education which can better be understood by studying the objectives of drawing the curriculum. In addition, various characteristics of teachers are pointed out in the chapter’s review of relevant models of teacher education, such as the instructor-centred model, the student-centred model and the community-centred model, all of which are categorized under the models for teaching and learning. The chapter also attempts to propose the needs and procedures to derive an eclectic, holistic, worthwhile, competent and effective

teacher education model as they reflect a huge expectation in educational achievements based on several unique assumptions and eleven major phases of curriculum design.

In summary, this chapter describes the concepts of teacher and teacher education and analyzes some paradigmatic shifts in teacher education. This work concludes by agitating for competent teachers, action research-oriented teachers, and competency-based curriculum as a blend of these is expected to yield creative, intelligent, self-reliant and productive learners.

Entrepreneurship in Teacher Education: Issues, Trends and Prospects

Victor Owohtu of the University of Lagos, Nigeria, discusses entrepreneurship in teacher education, beginning with the definition of entrepreneurship education as ‘education aimed at providing students with the knowledge, skills and motivation to encourage entrepreneurial success in a variety of settings’. The efforts of the Nigerian government in developing entrepreneurship education in Nigeria are discussed. The chapter highlights the activities of different agencies and international organizations at promoting entrepreneurship education in Nigeria, including the GET IT training centres initiated by the United Nations Industrial Development Organization (UNIDO) and Hewlett Packard (a foreign company).

The chapter dwells on the dilemma facing teachers in the teacher training institutions. While there is huge economic potential in the educational sector, and the teachers have been equipped with the entrepreneurial mindset through taking courses in entrepreneurship in the training schools, should the teacher now leave the classroom to start his or her own business or should the teacher tap into the huge private teaching market at the expense of his or her effectiveness in the class and at the risk of being at loggerheads with his or her employers? The chapter also raises a pertinent question: While doctors and lawyers in the academia have found a way to successfully combine private practice with their normal work in school, can teachers also be allowed to do likewise?

The chapter concludes by calling for full implementation of entrepreneurship education in African countries through appropriate information and communication technologies.

Integrated Pedagogical Approaches for a Productive Teacher Education

Cecilia Olubunmi Oladapo of the University of Lagos, Nigeria, carried out a survey on ‘Integrated Pedagogical Approaches for a Productive Teacher Education’. Her study provided answers to four research questions. Three federal universities and three state colleges of education in southwest Nigeria were used

for the study. A total of 600 subjects (50 lecturers and 50 students from each of the three universities; 50 lecturers and 50 students from each of the colleges of education) were randomly selected from southwest Nigeria; and all these constituted the sample size for the study. A researcher-constructed questionnaire captioned 'Integrated Pedagogical Approaches for a Productive Teacher Education' which was used for the study.

From the research carried out, the study concluded that 'direct teaching' or 'whole-class teaching' approach is the most common approach used by teacher trainers in our faculties and colleges of education, causing negative effects on the productivity of teachers. Also, the fact that many teachers believe the approach is better for achieving goals and objectives in teaching subjects quickly makes it more prevalent in teacher training institutions, thus affecting the educational standards and levels of productivity of teachers in the society. In conclusion, the author recommends a more eclectic and creative approaches to teaching.

Strategic Planning for Quality Teacher Education

The focus of this chapter by Ayo Alani of the University of Lagos, Nigeria, is on processes involved in developing a strategic plan for a quality teacher education. Strategic planning is a process that includes a set of interactive and overlapping decisions, leading to the development of an effective strategy for a given system. The chapter lists the major strategic planning process commonly adopted by organizations – SWOT (acronym for Strengths, Weaknesses, Opportunities and Threats). In concluding; the chapter calls on teacher training institutions to adopt strategic planning before drawing out their budgets, so that all strategic objectives are covered, rather than the usual myopic areas which current budgets cover. The chapter also admonishes teacher training institutions to engage all stakeholders, such as students, lecturers, teacher associations and international partners before spelling out their vision and mission statements so as to benefit from the experiences of all concerned.

The book consists of eighteen chapters by twenty-three authors from six universities across Africa: the University of Ibadan, Nigeria; University of Lagos, Nigeria; Lagos State University, Ojo, Lagos, Nigeria; University of the Western Cape, South Africa; Kampala International University, Kampala, Uganda and Olabisi Onabanjo University, Ago-Iwoye, Nigeria. The scholarship in this book is quite sound and the authors have presented their arguments very clearly with supporting evidence from countries across Africa. This diversity of institutional and authors' viewpoints enrich the book's scope and make it a particularly useful source of knowledge about teacher education in Africa in this digital age.

2

Re-profiling the Teacher and Teacher Educators

Pai Obanya

Introduction

For reforms in education to be effective in the real sense, they should address fundamental issues and not just tinker with the mere surface manifestations of educational challenges. Teachers are key actors in the education process and every meaningful reform of education should always pay due attention to the teacher factor. This discussion takes on the issue of the teacher factor as a fundamental one in education reform. It is concerned mainly with looking at fundamental reforms in teacher education from the very first principle of determining who a teacher is, or, to put it in question form : What type of person should engage in teaching?

A more fundamental issue deals with the making of (or educating) the teachers, for teachers are a product of a professional socialization system that, to a large extent, determines their effectiveness. The discussion, therefore, combines two related fundamental reform areas in education: that of determining who should teach, and more particularly, who should teach the teacher.

Paradigm Shifts

The Real Teacher

The prevailing profile sees the teacher as the professional with a minimum of 6+3+3+3 years of general education and professional training in education, that is, in the Nigerian case, someone with a minimum qualification of NCE (Nigerian Certificate in Education). Such a person is usually described as a qualified teacher.

There are three problems with this viewpoint, namely :

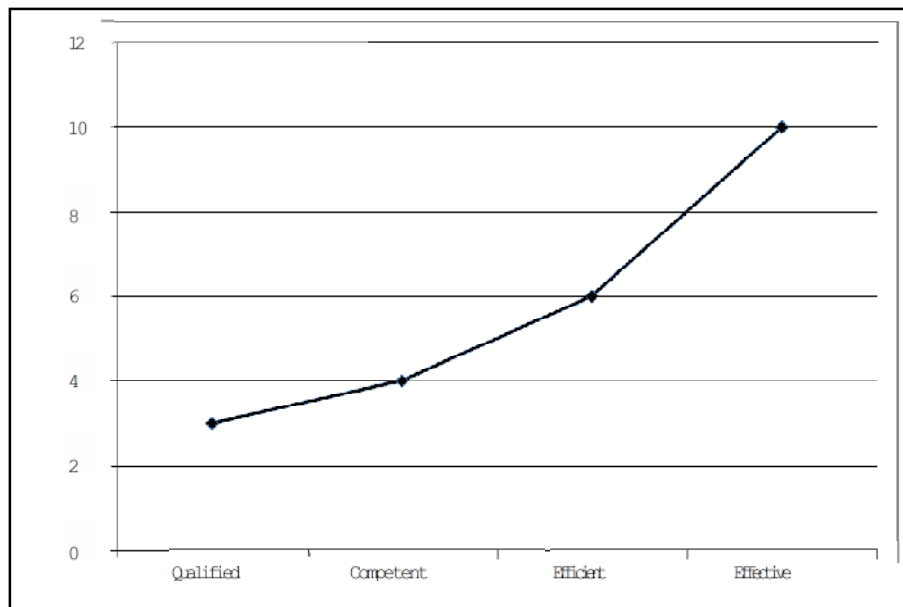
- A qualified teacher is not necessarily a competent teacher ;

- A competent teacher is not necessarily an efficient teacher ;
- An efficient teacher is not necessarily an effective teacher.

A qualified teacher is one with the requisite or prescribed minimum general and professional qualifications. Here, the emphasis is on undergoing prescribed courses and being crowned with an approved certificate that confers an approved qualification. A competent teacher is one who, in addition to being qualified, is also knowledgeable in methods and principles of promoting learning in students. Higher on the scale is the efficient teacher. The efficient teacher is able to apply the prescribed teaching methods as directed. The effective teacher, on the other hand, has mastered the prescribed methods but applies them creatively and, as a result, ensures quality learning in students.

The real deciding factor is the promotion of quality learning in students. Teaching can be said to have taken place only when the learner has learned something that can transform intellect, emotions, perceptions, and skills. The teacher's qualifications, knowledge and application of pedagogy therefore become significant only when they are creatively applied to ensure positive transformation in learners. Figure 2.1 below illustrates the relative gains of the use of various types of teachers.

Figure 2.1: Gains (mainly in terms of student quality) of Learning with Different Categories of Teachers



Generally speaking, the gains become higher as one moves from the merely qualified to the fully effective teacher. For this reason, investments in teacher education should be with the ultimate aim of optimally focussing on effective teachers.

From Teacher Trainer to Teacher Educator

This is in itself dictated by the paradigm shift from ‘Teacher Training’ to ‘Teacher Education’. As illustrated in Table 2.1, while teacher training merely focuses on pedagogical skills acquisition and updating, teacher education is a much broader concept. The focus here is on the all-round education of the teacher. The training component is simply a subset of the more all-embracing education of the teacher.

Table 2.1: Teacher Training vs. Teacher Education

Focus of Teacher Education	Focus of Teacher Training
Operates at a variety of hierarchical levels	Operates at a single level
<ul style="list-style-type: none"> o Concerned with the overall development of the person, like any genuine education programme o Learning to learn skills o A broad, general education base o In-depth, specialized knowledge o Theoretical foundations of professional practice o Reflective, research-oriented professional skills development o Career-long self-development potentials o A CONTINUUM – from pre-career all the way throughout career 	<ul style="list-style-type: none"> o Teaching skills acquisition o Updating of previously acquired skills o Re-skilling limited to ‘how-to-do-it’ demonstration techniques o Usually a once-in-a-while affair o At best, a periodic/occasional affair

This is the logic for moving beyond the ‘teacher trainer’ to the more all-embracing concept of ‘teacher educator’. The former is now outdated, as he or she is concerned with the more routine engagements of hands-on training (what to do and how to do it, demonstrating how things are to be done, all this resulting in the production of artisanal teachers, i.e. a teacher who merely does what the books say. A teacher educator, on the other hand, is more concerned with mind-on experience, dwelling on analysis and reflective pedagogical action, with a view to producing the creative teacher who is more likely to become an effective teacher.

The Changing World

The rapid changes witnessed presently are three major phenomena – Globalization, the ICT (Information and Communication Technologies) Revolution, and the Knowledge Economy.

Globalization is seen in the process of the world getting smaller. Products, designs, funds, ideas, services now move fast from one point of the globe to another, facilitated by developments in Information and Communication Technologies (ICT). This is a development with enormous potentials for breaking geographical, economic and cultural barriers among nations. It also poses a great challenge to countries that are yet to organize themselves politically, socially and economically. Thus, well organized countries are more likely to reap the benefits of globalization; while the not-so-well-organized are likely going to risk further marginalization.

The ICT Revolution can be seen and felt everywhere around us. Its potential for making life easier is enormous, and even in poor countries, its spread has been quite breath-taking. The computer is penetrating all spheres of activity; there has been an overwhelming rate of penetration of the cell phone, the use of which has become entrenched (in less than a decade) as an integral part of today's global culture. The internet and the worldwide web are now part of our active vocabulary, even if we are yet to generalize access to these wonders of the modern world. Satellite communication has improved our access, through wireless radio and cable television, to news and information from an increasingly globalizing world. Tele-conferencing is gradually becoming a medium of learning and exchanging ideas. We also live in a world of 'e-everything' (e-learning, e-banking, e-governance, etc). The scratch culture is also spreading, as we now register for examinations, university courses, etc., 'online' (another expression that has become part of our active vocabulary). Today's world has also gone 'virtual', as we begin to operate from virtual offices, and establish virtual institutions like the African Virtual University. Finally, online testing and examinations are already catching up with our institutions.

The Knowledge Economy is yet another revolution in our thinking of what constitutes wealth and power and the attitudes, values and skills needed to create and sustain these. Box 2.1 shows the characteristics of the Knowledge Economy. In our context, what is perhaps the most important message here is that 'natural resources are less important (in considering the wealth of a nation) than human endowments'.

Box 2.1: Seven Major Characteristics of the Knowledge Economy

1. Unlike physical goods, information is non-rivalled – not destroyed in consumption. Its value in consumption can be enjoyed again and again.
2. Bridges are being built between various areas of competence, as codification tends to reduce knowledge dispersion.
3. Learning is increasingly becoming central to both people and organizations.
4. Learning involves education and learning-by-doing, learning-by-using, and learning-by-interacting.
5. Initiative, creativity, problem-solving and openness to change are increasingly important skills.
6. Flexible organizations are becoming the norm. They integrate ‘thinking’ and ‘doing’ and avoid excessive specialization and compartmentalization, by emphasizing multi-task job responsibilities.
7. Whereas machines replaced labour in the industrial era, information technology has become the source of codified knowledge in the knowledge economy, demanding uniquely human skills such as conceptual, interpersonal and communication skills.

Implications of Contemporary Trends for Education

Developments require the participation of a different type of human being, who will have to be developed by the education system. Developments have also revolutionized our concept of the educated person and the type of knowledge, skills, values and attitudes that education should inculcate in all citizens. In summary, the implications are as follows:

- Education no longer prepares an individual for specific jobs
- The principal goal of education is no longer the terminal certificate or diploma but the inculcation of learning-to-unlearn skills.
- Education now combines the inculcation of ‘knowing yourself’ or ‘developing the best in you’ (intra-personal skills) with ‘knowing and getting along with others’ (inter-personal skills).
- In addition to developing mental (or cognitive) intelligence – brain power – the knowledge economy has brought to the fore a complementary type of human power – Emotional Intelligence (the ability to manage one’s emotional and psychological dispositions).

Creativity (lack of rigidity, a willingness to explore new paths and new ways) is now the hallmark of the educated person.

Persons who have benefited from education are now expected to have acquired a combination of ‘hard’ and ‘soft’ skills.

Of particular importance here is the need for education to emphasize both the ‘hard’ and the ‘soft’ skills – as further illustrated in Table 2.2 below.

Table 2.2: Hard versus Soft Skills in Education

Conventional (Hard) Skills	Contemporary (Soft) Skills
Cognitive Intelligence	Emotional Intelligence
Self expression skills (oral, written, etc.)	Character Formation Skills (for strengthening the total person)
Logical Reasoning Skills (for analysis and problem solving)	Intra-personal Skills (for the individual to understand his/her personal strengths and weaknesses, as well as possibilities/potentialities)
Computational Skills (for quantitative reasoning)	Inter-personal Skills (for understanding and ‘teaming’ with others)
Design/Manipulative Skills (for purely technical reasoning and action)	Lifelong Learning Skills (knowledge-seeking skills)
Conceptual Skills (for generating ideas and translating them into ‘action maps’)	Perseverance Skills (for seeing ideas and projects through to fruition)

It is necessary here to draw special attention to the soft skills in the right hand column of Table 2.2. They are the ones that really make the person. They are the skills that today’s world of work require. They are the skills that sustain a life of continuous learning. They are the skills that should be consciously promoted in all types and at all levels of education.

Profiling Today's Teacher?

In view of the foregoing discussions, re-profiling the 'teacher' would require efforts at three levels – the person who should teach, the skills package required of such a person, and the pedagogical skills needed to respond adequately to the demands of rapidly changing times.

The Person Who Should Teach

Selection for teacher education has so far tended to dwell on some minimum educational qualifications, while teacher education has emphasized 'content and methods' with insufficient attention to the person. There has therefore been a neglect of the 'soft' skills that can promote a 'teaching personality'. Listed below are such key soft/personality skills that contribute to making someone a successful teacher (someone who has attained self-fulfilment through teaching and one who can be turned into an effective teacher):

1. Love of learning and knowledge – an important trait for persons in the frontline of promoting learning and the knowledge profession,
2. Love of learners – the work of every teacher centres on facilitating learner development; thus, love of learning should be mainly for the interest of learners,
3. An eye (as well as an ear) for community signals – the ability to follow the evolution of society as a means to ensuring that school work derives from societal dictates as much as possible,
4. Grooming (in appearance, dressing, talking, relating to others, etc.) – a means through which the teacher teaches by personal example,
5. Gender-responsiveness – with particular emphasis on the ability to remediate obstacles to full participation of girls in schooling,
6. Acceptance of differences (racial, ethnic, gender, religious, political/ideological, etc) – implying the avoidance of prejudice and stereotyping,
7. Team play, as school work is team activity among teachers while helping the child to grow involves team work with parents and communities,
8. Professionalism – familiarity with education policy, curricula, examination requirements, commitment to continued professional development, maintenance of high standards, etc.
9. Role model for integrity, morality, work habits, etc.
10. Key emotional and social intelligence competences – self-control, patience, temperance, empathy, etc.

The Skills Package of Today's Teacher

The prevailing paradigm is that the teacher has to possess 'both the CONTENT (knowledge of specific areas) and METHOD (education principles and their practical applications). This paradigm has guided the development of teacher education programmes for years. However, with the demands made on education by contemporary global developments, teacher education will have to shift its gear and break its skills package to embrace the areas illustrated in Figure 2.2 below.

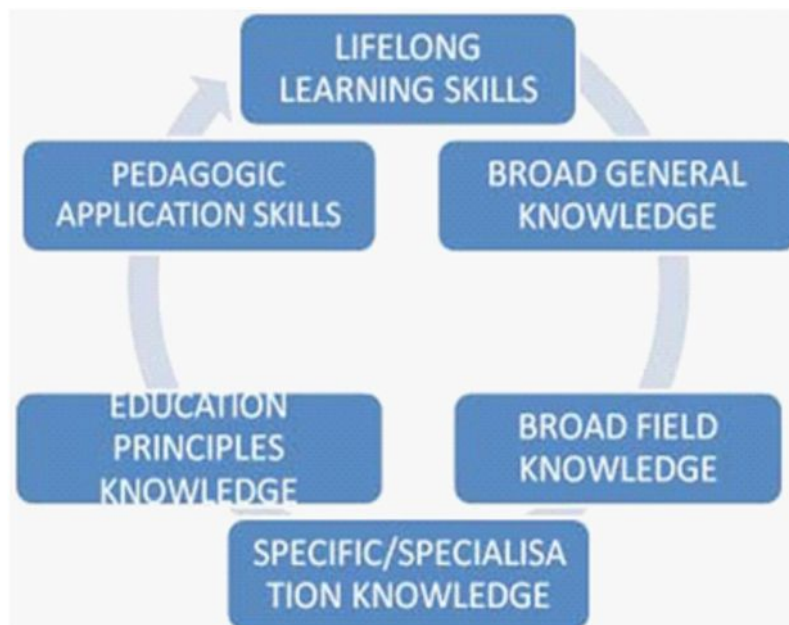


Figure 2.2: The Skills Package of Today's Teacher

The six areas of the skills package require the following of today's teacher:

1. The education foundation skill of 'learning how to learn',
2. Broad general knowledge as a foundation on which more specialized learning should be built,
3. Specific area knowledge, predicated on sound broad-based knowledge,
4. Specialized discipline knowledge, where appropriate,
5. Knowledge of education and pedagogy principles,
6. The ability to apply education/pedagogy principles in creative teaching.

Lifelong learning skills are paramount, as they provide the skills for the teacher's continuous development. Broad general knowledge would be needed to ensure

versatility and flexibility (including openness to new ideas) in the teacher. Broadfield area knowledge would form the bedrock for more specialized area study, to ensure the development of system thinking in the future teacher. Mastery of educational principles and their applications would be predicated on a solid base of lifelong learning skills and would form an integral element of broad-based, general knowledge.

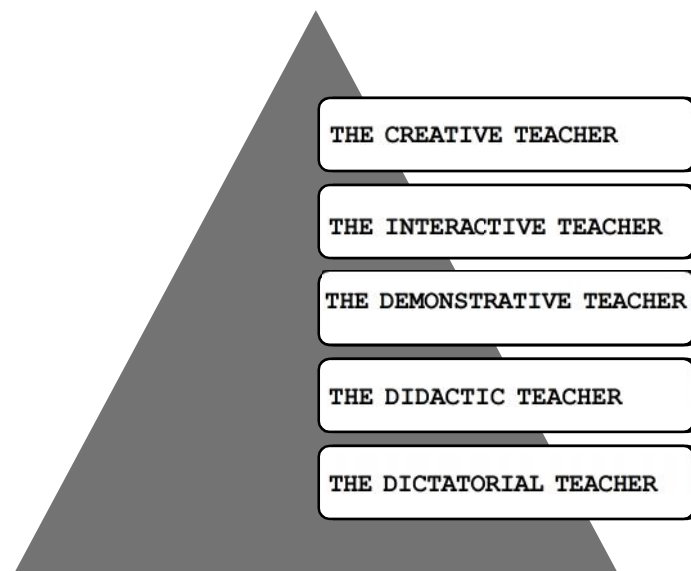
Today's Teacher's Pedagogical Profile

Observations and experience show that teaching can be done at different levels:

- Level 1 Teacher (Dictatorial): the all-knowing, stuffing the empty heads of students
- Level 2 Teacher (Didactic): has learnt the formal pedagogical rules and follows them blindly
- Level 3 Teacher (Demonstrative): allows student input but only of the 'say/do after me' type
- Level 4 Teacher (Interactive): encourages student participation, but still 'in-the-box thinking' bound
- Level 5 Teacher (Creative): creates responsiveness to specific teaching-learning challenges

These five levels form a pedagogic profile pyramid, as illustrated in Figure 2.3 below.

Figure 2.3: Teachers' Pedagogical Profile Pyramid



The qualified teacher of our discussion would tend to function at Level 1, the efficient teacher at Levels 3 and 4, while the effective teacher would function mainly at Level 5, even though with elements of Levels 2, 3, and 4.

Teachers functioning at Level 5 fall in the realm of 'Transformational Pedagogy' (see Box 2.2)

Box 2.2: Paradigm Shift Directions for the Transformational Teacher

**THE TRANSFORMATIONAL TEACHER WILL
OPERATIONALIZE A PARADIGM SHIFT**

- a. From the 'know-all' to the 'seeking to know how to know';
- b. From the talker to the listener;
- c. From the purveyor of knowledge and information to the co-seeker of awareness and insight;
- d. From the conductor of learning to the joint organizer of learning;
- e. From 'this is the answer' to 'there are multiple ways of looking at the issue at hand';
- f. From dictating to encouraging the search for solutions;
- g. From promoting the solo learner to building up the team-player.

In practical terms, Transformational Pedagogy is concerned with:

1. A complete re-conceptualization of the roles and functions of the teacher. The orthodox perception of the teacher is the all-knowing master whose authority must never be questioned (Level 1). Related to this is the specialist knowledge dispenser performing in front of a class according to rigid pedagogical rules (Level 2). An improved variant is the one who allows some talk and some action from students, but strictly of the 'say or do after me' type (Level 3). The paradigm is gradually shifting to the teacher who accepts that the learner is not a 'tabula rassa' and who encourages varying degrees of student participation (Level 4). The effective teacher is likely to be the one whose major approach is creating responsive approaches to match specific teaching-learning challenges (Level 5);
2. Situation which
 - a. Minimizes the lecture approach to teaching;
 - b. Capitalizes on the knowledge/experience/values and attitudes that students bring to the programme;

- c. Practices resourcefulness by sourcing materials beyond conventional textbooks, including mobilizing students to source materials;
- d. Discourages dictation in favour of discovery;
- e. Makes activities (mental/practical) by teacher and learner, and particularly among learners, the dominant teaching method;
- f. Accepts that the learner is central and so plans and executes teaching activities with the learner in mind;
- g. Accepts that a teaching-learning situation is one in which both teacher and student are learning;
- h. Accepts that teaching can be considered successful only after the learner has learnt;
- i. Realizes that successful learning means a positive and lasting change in behaviour, outlook, and ways of going about life;
- j. Realizes that successful learning begins when the student's capacity for continuous self-improvement has become a fully ingrained habit.

Transformational pedagogy aims at transforming the student at various levels: intellectually – enhanced creative thinking; attitudinally – enhanced capacity to explore, to take strategic initiatives; in terms of value orientation – enhanced commitment to converting obstacles to challenges; emotionally – enhanced self-awareness, self-management, and social awareness for improved social action and team membership.

A New Profile of the Teacher Educator

Most people tend to teach the way they were taught rather than the way they had been taught to teach. It is for this reason that teacher educators have to be exemplars of teaching method. Furthermore, every person employed to teach in institutions of teacher education must be a professional teacher with the following attributes:

- a. Exposure to the basics of educational studies and pedagogy;
- b. Practical school and classroom experience;
- c. Acquaintance with developments in education nationally and internationally;
- d. Personal involvement in educational leadership and development work-school management, guidance and counselling, curriculum and material development, etc.;
- e. Participatory action research.

What is most important is the development in teacher educators of the 'twin skills' illustrated in Table 2.3 below. Teacher educators have to be models (in their professional performance) that student teachers can copy, both consciously and

unconsciously. Consciously, students will ‘master the teaching model’ (as explicitly) conveyed by the teacher educator. Unconsciously, they will ‘model the master teacher’ (as implicitly conveyed by the tutor’s teaching behaviour).

Table 2.3: The Twin Skills Required of Teacher Educators

Mastering the Teaching Model	Modelling the Master Teacher
Excellent grasp of learning-promotion principles, techniques and technologies, and more importantly, the capacity to inculcate these in students	Internalization of learning promotion techniques and technologies, and more importantly, radiating these in the classroom, school, and work place interactions with students

Implications of the New Profiles for Teacher Education

Initial Teacher Education

To meet the requirements of the skills package of today’s teacher (see Figure 2.4), a broad- scope curriculum would be necessary. The essential elements of this are outlined in Table 2.4. It allows for exposure to lifelong learning skill. It also builds on a foundation of broad-based general education. These are meant to ensure that the teacher has the same level and type of skills acquired by other educated persons and members of other liberal professions.

The soft skills (discussed under the ‘teacher’s person’) earlier should also have a place in a broad-scope curriculum. They are best inculcated through applications of transformational pedagogy, as highlighted in Box 2.2.

Table 2.4: A Broad-scope Curriculum for Initial Teacher Education

Elements of the Skills Package	Appropriate Field of Study	Main Areas of Emphasis
1. Lifelong Learning Skills	<ul style="list-style-type: none"> ▪ Study skills ▪ ICT-fluency 	<ul style="list-style-type: none"> ▪ Efficient reading ▪ Writing for different purposes ▪ Effective verbal and written communication ▪ Team work and team play ▪ Computer basics ▪ ICT as learning and communications tool
2. Broad General Knowledge and Culture	<ul style="list-style-type: none"> ▪ National and world affairs ▪ Major challenges to human survival ▪ Civic awareness 	<ul style="list-style-type: none"> ▪ Information gathering and analysis ▪ Climate change, HIV/AIDS, population issues, etc ▪ Gender sensitivity ▪ Self-empowerment ▪ Civic responsibility
3. Broad Field Knowledge	<ul style="list-style-type: none"> ▪ Language and literature ▪ Mathematics and its applications ▪ Social science ▪ Natural/experimental science ▪ Creative/performing arts ▪ Vocational/practical arts 	<ul style="list-style-type: none"> ▪ Concentration on at least one of the broad fields, as foundation for Layer 4 below ▪ Basic education teachers may not require Layer 4
4. Specific Fields Knowledge	<ul style="list-style-type: none"> ▪ Any one of the broad areas in Layer 3 above 	<ul style="list-style-type: none"> ▪ In-depth study of any specialized areas of Layer 3
5. Knowledge of Foundations and Principles of Learning	<ul style="list-style-type: none"> ▪ Foundations of educational practice ▪ Management and organization of educational systems ▪ Curriculum studies 	<ul style="list-style-type: none"> ▪ Integrated 'foundations and principles' for basic education teachers (plus practical work in 'student guidance and counselling' AND the national curriculum and 'school organization') ▪ More detailed/separate subject studies for senior secondary teachers <ul style="list-style-type: none"> ○ Historical/philosophical/psychological foundations/sociological foundations ○ Management of education ○ Curriculum principles/analysis of the national curriculum – philosophy, orientation, organization and content
6. Educational Principles Application	<ul style="list-style-type: none"> ▪ General pedagogy ▪ Practical guides to teaching and learning specific subject disciplines ▪ ICT applications ▪ Supervised school and classroom practice 	<ul style="list-style-type: none"> ▪ Practice-oriented activities in a variety of forms <ul style="list-style-type: none"> ○ Lesson/syllabus planning ○ Textbook/educational materials analysis ○ Learner needs assessment ○ Classroom organization/interaction methods ○ School and classroom organization ○ Design of teacher-made pedagogical materials ○ Practical work with children in school and classroom settings

Continuing Professional Education and Development

Transformational pedagogy is also required in ensuring the continuous professional development of teachers. The following are some practical guides for that purpose:

1. Systematically building continuous self-improvement into teacher management, and making this mandatory for continued professional recognition and career progress;
2. Going beyond teacher updating (acquiring new knowledge and techniques) and teacher upgrading (acquiring higher qualifications) to include 'teacher development' in a more comprehensive sense;
3. Supervising and inspecting schools and teachers beyond mere fault-finding to becoming a 'clinical process' of (a) diagnosing challenges that teachers face in trying to promote learning; (b) working out with teachers appropriate strategies for addressing such challenges; (c) monitoring the processes and the results of applying the strategies; and (d) drawing appropriate lessons from the experience for the continuous improvement of the teacher, the individual institution, and the entire system;
4. Meeting teachers' learning needs at different career points. This is simply a way of acknowledging the fact that teachers' learning needs would likely witness shifts at different points in their careers. For that reason, in planning teachers' continuing development programmes, teachers in the early years of their career will concentrate more on professional (task skills) and academic improvement (up-dating knowledge). Middle and top career teachers will have opportunities for general education, with introduction to management-related programmes, while teachers in supervisory and management positions will have adequate exposure to management skills development (process and strategic thinking skills);
5. Preparing the teacher for educational leadership roles. Teachers are often deployed to a variety of leadership functions in national education systems without appropriate induction or adequate preparation, in terms of re-skilling. That situation should change and teachers identified for higher roles (both at the institutional and at the systems levels) should be given adequate preparation in terms of theoretical knowledge and opportunities for hands-on/minds-on experiential knowledge.

Professional Preparation of the Teacher Educator

It is important that all teacher educators familiarize themselves with the concept of the Learning Pyramid (see Figure 4). Their training would benefit from practical activities on classroom observation technique, in peer-reviewed teaching, and activities geared towards the application of the learning pyramid to maximize student learning.

In the process, the emphasis should be on 'teach-me-the-way-you'd-like-to-be-taught'. Prior qualifications and experience would not be sufficient preparation for the function of the teacher educator. Specific grooming would always be needed.

Figure 2.4: Learning the Concept of the Pyramid



The implications of the applications of the learning principles are as follows:

1. When a teacher teaches material that can be put to immediate use (e.g. linking educational theory immediately to practice), learner retention rate can be as high as 90 per cent.
2. When people learn by doing, they can retain up to 75 per cent.
3. Learning in discussion groups can yield a retention rate of up to 50 per cent.
4. With the teacher merely demonstrating, retention rate can drop to around 30 per cent.
5. With mere exhibition and flashing of audio-visual materials, retention can further drop to 20 per cent.
6. Merely reading to students can reduce retention to a bare 10 per cent.
7. Finally, and worst of it all, the lecture as major teaching method reduces retention drastically to just 5 per cent.

Conclusion

Teacher education in the digital age must deal with fundamental issues if it is to make meaningful and lasting impact. Teacher issues are of fundamental importance in education reforms, as no national education system can rise above the level of its teachers. The level of teachers is dependent largely on (a) the person of the teacher; (b) the education that the teacher gets; and (c) the pedagogical skills of the teacher. This discussion has dealt with ways in which these three dependent variables of 'teacher level' can be enhanced by re-profiling both the teacher and the teacher educator.

Re-profiling the teacher is also a response to the demands of today's world, characterized by globalization, the ICT revolution, and the emergence of the knowledge economy. This new world has revolutionized thinking on the goals of education and on how it should be delivered. Teaching has also been revolutionized to emphasize creative teaching methodologies in the overall context of transformational pedagogy. Teachers and teacher educators therefore have to be 'revolutionized' to fit appropriately into this new world.

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3

Policy Issues in Teacher Education

**Titilayo Dickson Baiyelo and
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Introduction

Policy issues in teacher education are discussed here in the context of the many prospects, challenges and even bottlenecks that are faced, encountered and experienced in the process of teacher preparation and negotiation of the training of teachers with best practices. For this reason, the focus of teacher education discussion here is policy issues.

Conceptual Clarification

It seems appropriate to start this chapter with definitions of policy issues and teacher education in order to provide the required conceptual framework and dispose of a few problems in this regard. The *Oxford Advanced Learners Dictionary* of current English gives the following as one of the definitions of the word ‘policy’ – “statement of aims, or ideals, especially one made by a government...”. In this chapter, the use of the term ‘policy’ in teacher education will be closely related to the definition given above; that is, a statement or guideline of nationally and/or professionally derived conceptions, philosophy, aims, objectives, ideals, practices and expectations to give a focus, direction, structure, reward, professional preparation, certification, licensing, competence, guide, ethics, framework and essence in teacher education in all its ramifications. Policy in teacher education is distinguishable from other policies because it is expected to be futuristic, directional, prescriptive, focused and pedagogical. It is expected to specify desirable values and guide against uncertain/disruptive developments. It is also a response to socio-economic, dominant political and cultural pressures through space and time.

Policy in teacher education addresses and/or redresses certain on-going issues and by implication raises further issues posing as outstanding challenges. There

are two major possible perceptions of curriculum issues considered relevant in this context. One is to look at the historical perspective in terms of fundamental issues addressed in teacher education and their outcomes or achievements. The other perspective is to attempt a critique of the various attempts by focusing on outstanding issues or challenges to be redressed. This is to refer to recurring or emerging important topics that people are discussing or arguing about in the context of teacher education today. These are essentially fundamental, controversial or sensitive worries and score points requiring more time to think about pragmatically for both individual and corporate good. One may also consider the benefits of certain policies in an attempt to point the way to better policies in future. Perhaps it can be argued that the first perspective relates to policy, while the second perspective relates to policy issues.

Generally then, an issue can be seen as a point in dispute, a point on which a question depends, a question awaiting decision or ripe for decision (MacDonald 1978). It is an unresolved situation. When resolved in a formal or legal way, it becomes a policy. If it is unresolved and left to hang on the whim and caprice of stakeholders and/or practitioners, it remains a traditional practice or convention, or even a contentious issue.

Adegoke (2010) describes teacher education, commonly referred to as teacher preparation, as ‘the art and science of institutionally providing pre-service or in-service or on-service training to prospective teachers in the theoretical basis, specialized knowledge and the acquisition of practical and applied skills, concepts, principles, strategies, techniques and styles with adequate attitudes and orientations’. He also defines a teacher as a trained, certified, registered and licensed professional, having attended a teacher training institution and successfully completed its prescribed teacher education programmes in the art and science of teaching his or her specialist subject(s) for the various levels of the educational system – pre-primary, primary, secondary and tertiary.

Purpose

The purpose of this chapter is to highlight some issues that gave rise to guiding the development and practice of teacher education, particularly in Nigeria, after attempting contextual definition of policy, policy issues and teacher education. In the process, we shall come upon issues which, though important, were not strong enough to require policy status but are cherished well enough in practice to acquire the status of conventions. Yet, there are others which are either still going through the process of becoming policies or yet to mature beyond issue status, for whatever reasons.

Policy Formulation and Teacher Education

A policy is a formalized practice. It is a convention ratified as a way of life. Issues beget policies once they have attracted enough of government attention. Government's first reaction is to set up a commission of enquiry to investigate the situation and advise it appropriately. However, government is free to accept, modify or even reject any of a commission's recommendations.

Once a recommendation is accepted in the original or modified form, governments' second reaction is to follow up by issuing a white paper which gives directives as to the implementation of ensuing policy encapsulated in a legal framework. The making of policies at individual, organizational and institutional levels is not any different in procedure.

Policy formulation in teacher education dates back to education policy formulation during the colonial period. This is not to overlook policy issues before colonization, especially during the missionary administration of schooling. It may suffice to note that policy in the various elements of teacher education can be seen directly or indirectly in the following:

- Elliot and Asquith Commission (1947);
- Richard Constitution (1947);
- MacPherson Constitution (1951);
- Ashby Commission (1959);
- Taiwo Committee (1967);
- Adefarasin Reports on the National Joint Negotiating Council for Teachers (1964 – 1965);
- Asabia Report of the Committee on the Grading of Duty Posts Voluntary Educational Institutions (1967);
- Other major Public Service Review Commissions, e.g. Harragin (1946), Gorsuch (1955), Newn (1959), Mbanefo (1959), Morgan (1964), Edward (1966), Adebo (1971) and Udoji (1959);
- The National Policy on Education (2007, new edition);
- Series of education laws (ordinances) and reports which were passed in Britain, West Africa and Nigeria between 1882 and 1994;
- Series of publications by governments or their agencies (e.g. problems of education in Nigeria (Education Sector Analysis);
- Constitution of the Federal Republic of Nigeria;
- Various edicts and decrees.

Policy in Teacher Education

The National Policy on Education (FRN 2004) has the expectation that teaching in Nigeria shall attain the highest standards possible. The policy restates the cliché that ‘no education system may rise above the quality of its teachers’ to emphasize the need for teacher education to be given pride of place in all educational planning and development. The policy states that the goals of teacher education in Nigeria shall be to:

- i. produce highly motivated, conscientious and efficient classroom teachers for all levels of our educational system;
- ii. encourage further the spirit of inquiry and creativity in teachers;
- iii. help teachers to fit into the social life of the community and the society at large and enhance their commitment to national goals;
- iv. provide teachers with the intellectual and professional background adequate for their assignment and make them adaptable to changing situations;
- v. enhance teachers’ commitment to the teaching profession.

Policy in teacher education revolves around teacher education institutions, with emphasis on the following:

- Recruitment of staff;
- Admission guidelines;
- Course content;
- Teaching practice and practicum;
- Certification and licensing;
- Funding, monitoring and evaluation.

At present, professional training is provided to teachers in Nigeria by the following:

- i. Colleges of Education;
- ii. Faculties of Education;
- iii. Institutes of Education;
- iv. National Teachers’ Institute (NTI);
- v. Schools of Education in the Polytechnics;
- vi. National Institutes for Nigerian Languages;
- vii. National Mathematical Centre (NMC).

Recruitment of Staff

FME (2009) revealed that recruitment requirements for lecturers in colleges of education (COE) are not rigorous enough. Most of the lecturers are not adequately prepared in the area to which they are assigned, e.g., Primary Education Studies (PES). Also, opportunities for the professional development of lecturers are few and far between. In-service Teacher Education (ISTE) programmes, and curricula offered teachers do not address their needs. Basic education teachers' exposures to ISTE are mainly through programmes for upgrading and certification through distance learning and 'sandwich' courses.

Admission Guidelines

Uniform admission guidelines are not strictly adhered to in colleges of education and universities. Many colleges admit candidates with four credits in SSCE, NECO and GCE 'O' Level examinations while almost all admit candidates with less than four credits through their pre-NCE programmes. Universities admit candidates with five credits. Most universities admit candidates with five credits at a maximum of two sittings, while few insist five credits must be passed at one sitting. The lack of uniformity in the admission guidelines leads to inability to attract only academically high-quality candidates.

Course Content

The course content in the college and the university programmes is inadequate for the demands of the knowledge economy (FME 2009). The mastery of subject content in areas such as science, mathematics and technology is poor, with emphasis on 'rote learning' and use of the lecture method. Instructional materials to aid teaching and learning are either not available or inadequate. Also, the application of Information Communication Technology (ICT) and modern media skills development in teaching is mostly poor and non-existing in some cases.

Teaching Practice

The duration of practical teaching is short, especially in university teacher education programmes. Classroom observation practice before teaching practice is not emphasized. There is little or no time for formal induction prior to teaching practice. Hence, the quality of supervision, lesson plan preparation and delivery of content by student teachers is low.

Certification and Licensing

After graduation from the college or degree programmes in teacher education, the new entrants are expected to be registered as is being done in other professions (e.g. medical, legal, etc). However, the situation on ground shows that the Teacher Registration Council of Nigeria (TRCN) has only been successful in registering very few new teachers, not to talk of recertification and licensing.

Link between Pre-service Teacher Education (PSTE) and In-service Teacher Education (ISTE)

At present, there are only few teacher education policies that link PSTE and ISTE so as to recognize the role of ISTE in teacher support and motivation in enhancing quality of instruction over time.

Funding, Monitoring and Evaluation in Teacher Education

Teacher education policies can only be effectively implemented if financing is adequate for sourcing of instructional materials, appropriate personnel, needed infrastructure and equipment.

Issues in Teacher Education

The issues in teacher education are:

- Which curriculum will lead to optimal role performance?
- Is the teacher education programme not often overloaded with pedagogy, compared to content?
- Should teacher education not focus on identifying decay, redundancies and gaps in the teacher education programme?
- Can we optimize the professionalization of teaching without addressing its shortcomings?
- Will licensing requirements limit or encourage diversity of the teaching force?
- Will raising licensing standards improve the quality of teacher education?

The Scope of Teacher Education

Teacher education covers such aspects of education and training as knowledge of content, ability to develop and implement the school curriculum, using the finest pedagogic skills acquired through pre-service instruction, school management, teaching practice, school visits, microteaching, in-service training workshops spiced with supervision and inspection, traditional and later electronic mentoring. Teacher education can therefore be evaluated under three main functions of accountability, professional development and curriculum review.

Teacher Education Course Duration

From the point of view of his or her education, for instance, shouldn't a teacher be expected to know more of the curriculum content in depth and breadth than the student he or she is supposed to teach? Currently, there is a hot debate as to whether a professional graduate teacher should or should not acquire as much knowledge of content as his counterpart in the non-professional cadre. The trend

in this debate seems to suggest that the professional graduate teacher's course should be five years, which means four years degree course plus one year postgraduate diploma in education, as against the present system of four years which combines both content and pedagogy. Universities vary in the way they choose from these two options at present. Hence, we can conclude that the duration of a professional teacher's course in education still remains an issue waiting to be resolved by the Federal Government.

Requirement for Professional Teacher Registration

Whichever option is adopted by teacher education institutions, once produced, a graduate teacher is registerable by the Teacher Registration Council of Nigeria (TRCN) on possession of requisite requirements. And since the Nigerian Certificate in Education (NCE) has by policy been prescribed as the minimum qualification for teaching, teacher registration by TRCN starts from there. However, deadlines for registration and conditions compelling teachers to register; whether registration shall be necessary and sufficient or combined with licensing; and whether licensing shall be once and for all or to be periodically renewed automatically or through examination are still issues yet to be resolved.

Expansion of Intermediate Education

Our exploration of issues in teacher education starts from the period around Nigeria's political independence. Prior to independence, the Federal Government of Nigeria wanted to be advised about the state of preparedness of teacher education and training in taking over responsibility from the colonial government school administration. To this end, the Federal Government of Nigeria set up the Ashby Commission in 1959.

In its report, the Commission observed, among other things, that many teachers were uncertified and improperly trained (FGN 1960:41). It therefore recommended massive expansion of 'intermediate education' for upgrading the existing teaching force in primary and secondary schools (Ashby Commission 1959). In the view of the commission, massive expansion of intermediate education was necessary; but whether it was sufficient to solve the problem of inadequacy of teachers was another issue.

Mismatch between the Expansion of the Educational System and Enrolment into Teacher Training Institutions

The first reaction of the Federal Government of Nigeria (FGN) to the Ashby Commission Report was to set up the first four advanced teachers' colleges by the early 1960s to produce teachers in the intermediate cadre, a non-degree but high-quality professional certificate in education titled Nigeria Certificate in Education (NCE). This gave birth to the rapid growth of current Colleges of

Education (COEs) nationwide. It is informative to note that, within two decades, COEs had risen to forty-four in number. This rapid growth of COEs did not miss the observation of Adesina (1977) who raised an alarm about the imbalance between the expansion of COE and enrolment into teacher training institutions. This indicated that matching the growth of COE with enrolment into teacher training institutions had become another issue in spite of government's effort to overcome the deficiencies in teacher education.

A counter reaction of the FGN was to set up the Longe Commission in 1991 to revise Higher Education in Nigeria. After its investigations, the Commission remarked that the development of COEs had proceeded faster than that of the universities and polytechnics. In spite of efforts to beef up enrolment in COE, the problem identified by Adesina (1977) seems to still persist to date. Whereas most of the existing six-three COE by the 1994/95 session have a capacity of about 4,000 student enrolment, they remain grossly underutilized, as their average enrolment was about 1,240 students per college. This persisting mismatch is a major issue.

Threats to Capacity Building in Colleges of Education

The first threat is obviously the dearth of entrants into the COEs. Over the years, teachers have been terribly marginalized socially, economically and emotionally. This is so, notwithstanding the fact that our early political leaders were mostly teachers. It is surprising that they could not use their good offices to improve the lot of teachers generally. A great mathematics teacher once wondered how easily one can be motivated by political largesse to forget the agonies of the teaching profession (Lassa 1996:136). Although not peculiar to the Nigerian situation, teachers' salary level is extremely low, so also are their living conditions. Position, power and prestige seem tied to the levels at which the teacher functions in the school system – primary, secondary and tertiary – and these also tally with the leadership roles and responsibilities accorded them in Nigerian society. However, there are marked differences in remuneration between university and polytechnic teachers and for reasons of complexes attached by society to the varying modes of education, teachers and students alike continue to transit from polytechnics to universities in pursuance of degree certificates regardless of whether the courses offered will lead them to self-reliance or not. Recently, the Academic Staff Union of Universities won a sizeable increase in salary and emoluments while secondary school teachers only won a moderate increase which is not yet being paid in some states of the federation.

Sometimes, remuneration of teachers varies across regions: teachers in Francophone countries earn better salaries than their Anglophone counterparts. In some parts of Africa, such as Liberia and Zimbabwe, teachers are treated like civil servants and workers in the private sector. They also have equal opportunities

for higher education and promotion (World Bank 1998; Lockhead and Vespoor 1990). These factors combine to affect the morale and status of teachers among other professionals. Teachers in Nigeria therefore have to resort to moonlighting, high turnover, incessant strike actions and low enrolment in teacher education institutions in order to make-up for their losses. The main issue at stake here is that even the teachers who have transferred to work in ministries are not visibly seen to work against the marginalization of their colleagues who are still in the classroom.

Combating Aversion for the Teaching Profession

The total effect of the factors posing threat to capacity building is aversion for the teaching profession and this has greatly brought down the projected enrolment in teacher education in Nigeria in both universities and colleges of education to an estimated annual decline of 6.4 per cent. In the 1998/99 session, about 30 per cent of COEs operated with less than 1,000 students. Nine COEs even operated with less than 500 students. The issue at stake here is that efforts taken so far to combat aversion are indirect (Isyaku 2002).

Similar aversion to the teaching profession witnessed at the COE level has now become obvious in the enrolment at the universities' faculties of education where annual decline was estimated at about 6.4 per cent (Ali 1998). This implies shortage in the production of secondary school teachers. This is not yet properly addressed.

Pre-NCE Special Preparation Programme

With some universities insisting on five WASCE credits at a sitting and others accepting five at any two sittings for admission of students, most of the well-qualified students find their way into universities. Those with three and four credits make do with polytechnics and colleges of education. It is obvious that those with two credits and less will require some sort of preparation to make-up. Initially, make-up courses were mounted for admission into Technical Education, Science, French and Nigerian Languages. As the pre-NCE special preparation programme gained popularity however, most colleges of education now have make-up-courses for virtually all disciplines. Consequently, this has become a special mode of entry into the COEs. The issue at stake is the lack of control regarding this mode of entry.

National Policy on Teacher Education and Professionalization

The National Policy on Teacher Education openly asserts that:

- i. No education system can rise above the quality of its teachers (FGN1981);
- ii. All teachers in our educational institutions, from primary to university levels, will be professionally trained; and

- iii. NCE will ultimately become the basic qualification for entry into the teaching profession.

While (ii) above serves as a reference point for the professionalization of teachers in Nigeria, (iii) provides an index of quality control for recruiting teachers. There is, however, the need to watch how (ii) is applied in recruitment as the present practice of using NCE (primary) teachers to teach in secondary schools and using NCE (secondary) teachers to teach in primary schools is an abuse of the provision and capable of lowering standards. Non-specialized colleges of education produce teachers attuned to both programmes. Other safeguards for upholding standards include the supervisory role of the National Commission for Colleges of Education (NCCE) which was established in 1989. The NCCE uses accreditation and monitoring to uphold conformity with the requirements of the National Policy on Education. The NCCE also handles the certification of all NCE programmes from 1992 when the minimum standards came into effect. There are a few practices which indicate autonomy. Some colleges of education and colleges of higher education abroad (e.g. in United Kingdom, Scotland and Australia) award degrees. At present, only the NCCE can approve the award of degrees by colleges of education and it is always in affiliation with universities accredited by the National Universities Commission (NUC). A major issue is the existence of auxiliary teachers, most especially in the North, an aberration to the application of the policy countrywide. Another major issue is what to do about the quality of non-professionalized lecturers in colleges of education, polytechnics and universities.

Reviewing School Curriculum

Recent reforms undertaken by the Nigerian Educational Research and Development Council (NERDC) to review the school curriculum were based on the hint by Adeniyi (2002) that there was nothing wrong with the content of the curriculum but, rather, it was the implementation that was faulty. Consequently, the old Integrated Science curriculum for Junior Secondary School (JSS) has now been transformed into Basic Science while the former Elementary/Primary Science is now Basic Science and Technology. Other notable changes are:

- removal of overloading in places;
- addition of few concepts relating to needs of the society/community;
- increase of practical activities in many subject areas;
- stepping up the provision of equipment and facilities to back up practical activities.

A project intended to step up capacity building in ICT content and pedagogy was instituted under the project Science and Technology Education Post Basic (STEP “B”) at secondary and tertiary levels in both technology and science.

Attempts are currently being made to revive the Secondary Education Commission in order to coordinate efforts in sustaining the various projects at the basic and post-basic levels.

The Lagos State Government has gone ahead to initiate a version of the Step-6 project in core courses. It is named Eko Project but, unfortunately, the materials on the review of the school curriculum are not yet available to the public in bookshops. This constitutes a big constraint to project implementation. Many of the new procedures for managing the funds of the Eko Project, as well as the training given to the school staff for handling the transaction with the World Bank, are largely unknown and hence misunderstood. This precludes probity and accountability in the eye of the public. It is, however, too early to judge how the new relationship between the school, the school authority and the Bank will work out to eliminate sharp practices in the funding of the school system.

LNG Award in Literature and Science/Academy Affairs

The recent institution of Liquid Natural Gas (LNG) award in literature and science is heartwarming because it presents challenge at the ultimate level of endeavour for the Nigerian public. Awards already made confirmed the class of the winners’ achievement. However, the way it is being operated at the moment has pitched the award at the highest level which seems slightly restrictive. What will be more motivating to the entire populace would be a mode of operating it across various levels of education such as the primary, secondary, tertiary, postgraduate and post-doctoral. So also is the running of Academy affairs in Nigeria, pitched at the highest level. The merit is that it motivates Nigerians to aspire to be creative and innovative like their counterparts anywhere and tackle the challenges of living. It will, however, be more inspiring and self-sustaining if their activities could be spread across the various educational levels. This is capable of motivating the young ones to learn the ropes of creativity and innovation gradually. The significance of these events for teacher education is that they are all operated at the highest possible level by teachers and they can very much complement the work of teachers towards a higher level of achievement by their students if well organized at various levels as suggested. At present, the restricted mode in which they are organized constitutes a major issue requiring policy change.

Future Prospects for Teacher Education in Nigeria

Adams (1930) has long made a promising prediction capable of sustaining the hope of a bright future for teachers and teacher education worldwide when he described education as ‘an instrument par excellence for national development’

(FGN 1977). This is however subject to commensurate improvement in the wellbeing and status of teachers. Some imaginative and far-reaching strategies of achieving this lofty ideal are:

- i. Okonji (1997) model of multiple intake regimes, scheduled over morning and afternoon shifts cascaded into two alternating stretches of time and students, is capable of producing graduates of three sessions in two calendar years. This is a way of maximizing the use of available facilities without the need to build more colleges of education.
- ii. The Joint Admissions and Matriculation Board (JAMB), acting within its mandate as a clearing house for students' admissions, should be able to regularize Pre-NCE admission in a similar way as the direct entrants into the B.Ed degree programme of the universities.
- iii. The Teachers Registration Council of Nigeria (TRCN) should arrange for the enthronement of professional ethics through internship, inspection and assessment of qualified teachers before certification for registration. It should also arrange for refresher courses for practicing teachers.
- iv. In view of developments in the wider society in terms of modes of dressing and communication, there is need to streamline the code of ethics to govern the behaviour of teachers across levels, with particular regard to dressing, relationship with pupils/students, colleagues, school proprietors, parents, visitors, limits of loyalty to union leadership, use of rewards and punishment. Also, morally debased teachers should be shown the way out of the service.
- v. Adequacy of teachers' remuneration is one big issue which never seems possible to resolve. Regularity in the payment of teachers' salaries seems so difficult to achieve. Also, special allowances granted to teachers of science, foreign languages, mathematics and technology education have not been paid regularly by the government and other proprietors of tertiary institutions. It might even be suggested that teachers of core subjects such as English, Mathematics and Basic Science posted to rural areas should be paid special inducement allowances. This may be an easy way of combating aversion to the teaching profession to a large extent.
- vi. One practice of keeping job positions for indigenes of a state is to give contract appointments to non-indigenes. This is inimical to sound morale and job satisfaction. To combat this practice, it is necessary to uphold the same conditions for all in terms of appointments, promotions, hours of work, retirement and pension. Automatic employment should also be offered to NCE holders while posting them to states where their needs will greatly promote job security, instead of discrimination in terms of

state of origin. This could also make the NCE more attractive and increase enrolment in colleges of education.

- vii. Involving teachers in developing the curriculum related to their functions confers some recognition on them. This leads to greater commitment in the discharge of their duties and upholding ideal standards. Those teachers who participate in marking of WASCE papers show these traits and are able to prepare their students for better results.
- viii. Instituting merit awards to honour teachers at various levels – local government, state and national – will surely motivate excellence in the performance of their duties. Such awards need to be extended to include school administration and management, games and sports, national examination, exemplary behaviour and discipline as well as long and untarnished service.
- ix. The tendency to trivialize the professional development of technical personnel in school laboratories should be discontinued as it is capable of lowering standards.
- x. An improved working environment is necessary for teachers. A comfortable staffroom has a way of enhancing teachers' productivity and promoting good social behaviour. When this is matched with attractive school environment, adequate teaching materials and equipment, teachers' morale and motivation are raised.
- xi. Empowering colleges of education to award the B.Ed. degree has a way of influencing the preferential patronage of returning students. When a college of education awards B.Ed degree, its status is greatly enhanced in Nigerian society.
- xii. Teachers' education, if made tuition free as against each state giving bursary awards to teachers-in-training who are its own indigenes, is more rewarding. Special allowances should also be paid for teaching practice, execution of projects and school attachment programmes.
- xiii. Grants-in-aid, if given to all colleges of education, public or private, will uplift the morale of all stakeholders, encourage the participation of all and enhance the acquisition and maintenance of equipment and infrastructural facilities toward the attainment of high standards.
- xiv. Current educational technologies, if fully employed, would make possible the floating of a Distance Learning System (DLS) which could network the programmes of NTI, sandwich and part-time programmes of colleges of education and universities, for upgrading the professional qualification of teachers.
- xv. Teachers already inservice will benefit from DLS in upgrading their qualifications and this can considerably enhance their career and morale.

- xvi. Organizing a sandwich system for serving TCII and auxiliary teachers in colleges of education during holidays will immensely benefit them in their career drive. But they will need some assistance as course fees and cost of instructional materials are often high while their pay is lean.
- xvii. Short-term strategies for the production of UBE teachers:
 - a. Three-semester pre-service training of students with three passes at the school certificate examination can be prepared to teach in the primary school and this is bound to remove some bottlenecks.
 - b. Setting up a two-year programme to raise students from colleges of education so that they can be redeployed on one full year of practical teaching in their respective states with shortage of teachers.
 - c. Camping failed TC II teachers for two semesters would be sufficient to help 75 per cent of them to scale over and this would be a boost to the provision of teachers for UBE.
- xviii. Admission of NCE graduates back into the NYSC programme, as was at its inception in 1976, will ensure a steady supply of quality teachers to the UBE scheme in states experiencing shortages.
- xix. Capacity building should be diffused to all states at all levels of education throughout the country. So also should the activities of LNG Awards and Academy Affairs.

Conclusion

Teacher production and utilization in Nigeria has been the context in which policy-related issues have been highlighted in most of this chapter. The prospects of increasing teacher supply were then listed as solutions to some of the issues were raised. Some actions embarked upon by academic/professional associations and private sector initiatives, to promote quality education and thereby aid teacher effectiveness, were also reviewed. It is the faithful implementation of these suggestions with all outstanding issues resolved that is bound to ensure the attainment of national objectives and a golden age for teacher education in Nigeria.

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4

Mapping Teacher Education Institutions for Excellence

Anne Fabiyi and Sheidu A. Sule

Introduction

Functional education remains the veritable instrument for the production of a citizenry that can revitalize the economy for global competitiveness. Effective teaching and pleasant learning should produce active literate and numerate persons who can clearly read and write with required understanding, and communicate thoughts without any ambiguity. They should also observe things and analyze emerging data for a conclusive resolution of human and societal problems (Oyekan 2006). This exclusive and arduous task of human resource development for economic growth in a digital era is carried out by teachers. Such individuals whose professional roles and achievements largely depend on their trainable qualities and determination to succeed should be provided with well planned institutional mapping so as to motivate them towards excellence.

Teacher education is the provision of professional education and specialized training, within a specified period, for the preparation of individuals who intend to develop and nurture the young ones into responsible and productive citizens. In Nigeria, it is informed by the fact that teaching is an all-purpose profession which stimulates the development of mental, physical and emotional abilities in students.

It is therefore vital that during their training, student-teachers should be given the opportunity to reflect on what the teacher's task is; to discover that it is much more than applying methods to do a job or 'parroting' right answers to pass an examination (Farrant 1980). In Nigeria, institutions charged with these responsibilities are faculties of education in the universities, the National

Mathematical Centre, colleges of education, the National Teachers Institute, institutes of education, and schools of education in the polytechnics. Today, the country needs a large number of quality teachers who are well trained, flexible and willing to learn, in order to cope with the bright, slow and average students. They should be sufficiently exposed to well-planned academic curricula, professional education courses, general studies in education and teaching practice, with a thorough knowledge of the ethics of the teaching profession. Such well-trained and well-groomed teachers in Nigerian classrooms shall be equipped with professional artistry and scientific process of adjusting education to the changing needs of the children and their environment, especially in this digital era.

Teacher education institutions are statutorily charged with the responsibility of providing professional education and specialized training within a specified period, for the preparation of individuals who intend to develop and nurture the young ones into responsible and productive citizens.

Present Situation (Problem)

According to Obiora (2006), one of the critical elements needed for the achievement of the Millennium Development Goals, Education For All (EFA) and the New Economic Partnership for African Development (NEPAD) and the Nigerian home-grown National Economic Empowerment and Development Strategies (NEEDS) are value reorientation and the empowerment of people through education. The improvement of the quality of education and promotion of ICT capabilities in teaching are expected to enhance the realization of the goals of all these and other development initiatives. Some of the immediate policies that have emerged as a result of these new global issues include: the adoption of a nine-year basic education programme (as an integration of primary and junior secondary school; new curriculum structure for lower basic, middle and upper basic; and their implication for the teacher training institution. According to the Nigeria National Policy on Education, the objectives of Teacher Education are to:

- produce highly motivated, conscientious and efficient classroom teachers for all levels of our educational system;
- further encourage the spirit of inquiry and creativity in teachers;
- help teachers to fit into the social life of the community and the society at large, and enhance their commitment to national goals;
- provide teachers with the intellectual and professional background adequate for their assignment and make them adaptable to changing situations; and
- enhance teachers' commitment to the teaching profession.

These objectives, no doubt, demand a matching teacher training programme. The importance of this programme was emphasized by Fafunwa (1967) when he argued that, of all the educational problems that beset African countries, none was as persistent (or as compelling) as the one relating to the training of competent teachers. The demand for more and better schools in all parts of the continent, the need to relate the curriculum to the child's environment and, indeed, the overall problem of preparing the future citizens of Africa cannot be effectively accomplished without the aid of competent teachers.

One wonders if, after four decades, the above assertion still subsists today, given the experiences in teacher education. At the primary and secondary school levels, challenges for teacher training institutions are quality of programmes (available resources, venue and period of programme, physical and infrastructural facilities, etc). Teacher education at the tertiary level is made up of two complementary components – the subject matter and teaching-learning process. While the subject matter focuses on subject mastery, teaching practice prepares the trainee for effective lesson delivery. The practice has been that, only about three to nine months at the most is made available for pedagogy in all the four years of the programme. The disruption of the school calendar, entry qualifications, large class size, as well as the absence of physical and other relevant infrastructure for the teacher training programme in institutions at all levels (primary, secondary and tertiary) have been the cause of inefficiency in this aspect of the nation's educational sector. Some other common challenges that cut across the board are poor funding of the institutions and poor image of the teaching profession.

Teacher-education institution mapping is a dynamic process of identifying, logically and systematically, the communities and sites where the necessary facilities for the training of effective teachers are to be located. The purpose of school mapping is to set up a school network which will meet, in the most efficient and equitable way possible, the future demand for education.

The theoretical framework guiding the research for this chapter is the Social Network Theory. The major concepts are critically examined and some of the factors to consider in productive teacher education institution mapping are also discussed. These include the political, pedagogical, geographical, demographic and economic resource factors.

Furthermore, the procedures toward achieving success in teacher education institution mapping are equally discussed. Finally, some challenging factors to effective teacher education institution mapping and strategies for dealing with them are also highlighted in the chapter. The chapter recommends, among others, the training of technical personnel or experts in educational administration and planning to handle the mapping of teacher training institutions, especially in this digital era.

Theoretical Framework

The Social Network Theory (Leydesdoff 1987; Debacere and Clabysse 1998; Kretschmer and Aguillo 2004) focuses on organizations, author-knowledge interaction and communication, and views social relationship in terms of nodes and ties. While nodes are considered as the individual actors within the network, ties are the relationships between the actors. Some ties are weak as a result of geographically remote collaboration but they can promote new knowledge. Detecting and visualizing researchers that function as weak ties between institutions will help to demonstrate communication of knowledge and may further identify the structure of invisible colleagues.

School Mapping and Teacher Education Mapping

Oluchukwu (1998) in Fadipe and Ojedele (2000) sees school mapping as the diagnostic stock-taking of the educational system, with a specific aim of determining what types and stock of resources and facilities that would be needed in the future, and how best the existing facilities can be put into optimal use, in view of the scarcity of resources. In other words, school mapping is the application of thought processes and analytical techniques to see within a short, medium or long-term plan.

Obadan (1978) in Fadipe and Ojedele (2000) and Madumere (2008) define school mapping as 'a dynamic process of identifying logically and systematically the communities and sites where educational facilities are to be located under a plan policy'. This is to say that it is, in a way, the process of assessing an educational system. The purpose of school mapping is to set up a school network which will meet, in the most efficient equitable way possible, the future demand for education. Based on the foregoing definitions, teacher education institution mapping can be seen as the dynamic process of identifying logically and systematically, the communities and sites where teacher educational facilities are to be located in a way that all qualified prospective teacher trainees will have easy access to them. In other words, the entire process aims at achieving excellence in the distribution of educational facilities to produce well equipped and highly effective teachers.

Excellence

From the point of view of Rogers and Ruchlin (1971), excellence is closely related to efficiency or productivity. It is through maximum productivity that excellence or efficiency is achieved. They further observe that there are two aspects of productivity maximization. First, any given set of inputs should be utilized so as to produce the largest value of output. Second, for a specified output and quality level, inputs should be chosen and utilized so as to maximize production. An excellent system can be compared to a system that produces the required benefits and, in its entirety, minimizes or avoids wastage.

From the perspective of Okeke (1985), organizational excellence depends on proper combination of two factors, namely the personnel skill factor and the equipment and supplies factor. Excellence in the school system is determined on the basis of the relationship between the inputs (students, teachers and materials) into the system and outputs (graduated students, dropouts) from the system. If a school system produces maximum output with minimum possible input, the system can be said to be excellent or efficient. Two types of efficiency, 'external efficiency and internal efficiency' are discernible in the school system.

According to Coombs (1968), internal efficiency refers to the relationship of the inputs of the school system to outputs while external efficiency is the degree to which the school system meets the broad social, cultural and economic objectives of the society, that is, the ultimate benefits to the society from their educational investments (input). It is difficult to measure the external efficiency of the school system, one of the reasons being that it is not easy to monitor or measure the performance of the students who have graduated out of the system. The internal efficiency of the school system can, however, be measured.

Having defined or explained the major concepts: teacher education, teacher education institutions, teacher education institution mapping and excellence, we shall examine how we can use teacher education institution mapping to achieve excellence in the system. In order to do this, we shall consider the objectives of, as well as factors to be considered in, teacher education institution mapping. Furthermore, we shall identify and discuss the necessary procedure in teacher education institution mapping, namely, the diagnosis, enrolment, projection and student flow model. Finally, we will discuss the procedures and techniques involved in teacher education institution mapping for excellence.

Making teacher education institutions more efficient by improving the ratio between cost and performance, that is enhancing the input-output ratio, is vital. When the school map is being drawn up, the objective will be to ensure that optimal utilization roles of the school site equipment and staff, and the length of time they are used, are the highest possible, bearing in mind pedagogic and administrative limitations. The idea is to overcome the short-sighted view of the school as an isolated unit. The school forms part of a body of social services to be distributed geographically in a consistent manner, and in such a way that the working of the external economic factors results in the most effective possible use of school resources.

Procedure in Teacher Education Institution Mapping

Techniques for teacher education institution mapping can be by extracting institutions, creating institutions matrix and mapping of institutional collaboration. In this sense, the following should be considered:

Demographic Factors and Mapping of Institutions

These factors readily come to mind whether the aim is that of setting up, expanding or altering the school network. The first question to be raised is that of the potential clientele and its distribution. Here, we take cognizance of population dynamics so far as they can be foreseen:

- i. A geographical levelling out of the condition of supply, through the creation of equal intake capacities and an equitable distribution of human, material and financial resources over the various areas;
- ii. Equal social opportunity for and access to schooling through active measures, encouraging students to enrol;
- iii. Reforming structures, curricula and methods. Here, teacher education institution mapping should make it possible to determine how schools may be reconverted and school sites relocated geographically so as to adjust to new characteristics of the school system as laid down in the reform programme (Oluchukwu 1999). In a nutshell, the specific objectives of teacher education institution mapping, besides assisting to realize the goals of teacher education, are: (1) to achieve equality of opportunity and (2) to improve efficiency in the use of resources.

The Pedagogical Factors

We consider quite a number of parameters such as the normal period of utilization of the school site, weekly time table (staff and student) and breakdown by courses, department by department (vocational, special, business, science, technical, etc). An attempt must be made to fix the optimum size of the school at each level of the system as this produces the size which, at the same time, affords the best possibilities for management and administrative control for the human character of the school and full utilization of staff and facilities.

Social Factors

These are to be analysed in the light of the outlook for a reduction in the local or state disparities between social categories, and the foreseeable strength to schooling – for instance, girls in some part of the North and boys in some part of the East.

Economic Factors

These involve looking into the lowest financial cost after a decision on optimum size has been taken, resulting in cutting out schools that are under-utilized, schools with high percentage of hostel accommodation, etc.

Geographical Factors

The first step in school mapping is the diagnosis of the present institutional network in the area under consideration. This will uncover any weakness and thus help us to re-design and rationalize it. In carrying out the diagnosis, a number of assessment criteria are used, viz:

- i. Does the existing institutional network meet the demand for education in the area?
- ii. Is the existing institutional network economical?
- iii. Is the existing institutional network equitable?

Basically, there are two categories of concern in the school system. These are intra-educational diagnosis (that is, those areas of concern that are within the school system) and the extra-educational diagnosis (those that are outside of the school system).

Areas of Intra-educational Diagnosis

- *Education Stock-taking:* This includes determining the number of schools, classrooms, teachers and teacher training facilities, science laboratories, workshops, books, etc., that make up the school system.
- *The Internal Efficiency of the Different Levels of Schooling:* This comprises the means of determining, for each level of school, the rates of retention and dropout, transition rates and promotion rates. This is an essential part of diagnosis since the problem of wastage is of primary importance in the school system.
- *Student Flow:* This is related to efficiency but it is distinct. It permits us to know, during the school mapping, what happens to the students as they go in, throughout the school system.
- *Financial Resources:* Part of the diagnosis must include the financial resources available to the school system for both capital expenditure (construction of school, purchase of equipment, etc.) and recurrent expenditure (teachers' salaries, maintenance and other expenditures that occur with predictable regularity).
- *Cost:* This is, of course, related to financial resources. There are all sorts of diagnostic tools and techniques for determining the costs of education. We can compute total cost per level, cost per student (primary, secondary or tertiary, etc). Costs are theoretically related to output.
- *Issues of Equality and Disparities:* Equality of access to education and equality of educational opportunities are essential concerns for school mapping. The basic sources of inequalities are social, sexual and regional.

Areas of Extra-educational Diagnosis

- *Demographic factors:* These include mainly the growth in the school-age population so that, during the school mapping, we can discern what the social demand for education will be in the future. The demographic information is broken down by geographic regions and sex.
- *Social-economic factors:* These include the social class structure, the rural-urban distribution of the population, and the general economic situations and prospects.
- *Political Factors:* These include the question of political stability and how it can affect the educational policies of the government. The concept of quota system, catchment areas, educationally disadvantaged or advantaged come into play.
- *The External Efficiency of the School System:* Basically, this refers to the ‘fix’ between education and the needs of the society, especially the labour market. On this count, a diagnosis wants to see what happens to school leavers and graduates: Do they find the jobs they were educated and trained for? How long does it take them to find jobs? In other words, have they been educated and trained to become productive citizens?
- *Geographical Factors:* These have to do with the concept of catchment area. A catchment area is the geographical area served by a school. It is important to bear in mind that the relief and size of catchment areas depend on the means of getting from home to school since, in practice, the variable which decides how large a catchment area may be is not the distance students have to travel but the time involved when they do it.
- *Political Factors:* Politics also may influence teacher education institution mapping. To unify the ethnic groups in a country, government may provide teacher education institutions to reflect the federal character. Political learners can also establish school institutions in all parts of a state or a country to facilitate access to education. The political objective may be to promote egalitarianism in the social group.
- *Transportation:* Transport facilities that will connect schools to the catchment areas for easy accessibility should also be considered in teacher education institution mapping.

Challenges Facing Effective Teacher Education Mapping and Resolution Strategies

Effective teacher education mapping in Nigeria is challenged by a number of factors. Some of these factors are as follows:

- a) *Lack of Qualified or Trained Personnel:* For effective teacher education mapping to be conducted or carried out, it has to be done by a team of experts in educational administration and planning. But in Nigeria, it is not uncommon to see a team of unqualified personnel carrying out such a specialized assignment. This can adversely hamper the achievement of the objectives of the whole exercise. Therefore, government at all levels should ensure more training of manpower, particularly in the area of educational administration and planning.
- b) *Lack of Storage Facilities for Data:* This is common in all developing nations. There are no adequate or durable material or recordkeeping facilities. In Nigeria, government should, as a matter of urgency, provide the necessary data storage facilities and data retrieval backup to the Ministry of Education and all educational agencies, for the purpose of effective data storage and retrieval.
- c) *Financial Constraint:* It requires some quantum of financial resources to obtain adequate information. In the process, one is required to travel from one place to another to collect the necessary data. But in a situation where insufficient or no money is released for this purpose, it becomes a problem for the right thing to be done, thereby affecting the objective of the exercise. It is therefore recommended that adequate financial resources should be made available by the government through the Ministry of Education, for the purpose of achieving excellence in teacher education institution mapping.
- d) *Political Factors:* In as much as politics and education are inextricably connected, there is need for politics to be divorced from education, particularly those areas of politics that have nothing to do with the growth and development of education. Hence, teacher education institution mapping should be done without any political pressure from any quota of the geographical formation.
- e) *Corruption:* Effective teacher education institution mapping is sometimes challenged by corruption on the part of some of our leaders. As we know very well, corruption is a crisis of pandemic proportions in our present-day society, particularly in the hearts of most or some of our leaders. Even when adequate resources are made available, because of this singular reason, these resources can be personalized or diverted from the purpose for which they were meant. Therefore, we must all have attitudinal reorientation towards public and private assignments.

Conclusion

The adoption of teacher education institution mapping in order to enhance excellence in the system implies a significant change in the method of planning for education and the implementation.

This requires:

- i. The design methodology which may be applied to all the states of the federation.
- ii. The training of technical personnel in charge of the preparation and implementation of the school map.
- iii. Setting up administrative structures responsible for the preparation and implementation of the school map at the three levels of government.

In this chapter, we have discussed the major concepts, namely, teacher education, teacher education mapping and excellence. In addition, the objectives of mapping teacher education institutions to achieve excellence have been highlighted. Finally, we have looked at some challenges that could affect teacher education institution mapping for excellence and proffered some resolution strategies.

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5

Teacher Education in Open and Distance Learning Universities in Africa

Adams Onuka

Introduction

The most potent objective of open/distance learning is the provision of greater access to education, especially as a second-chance opportunity and an alternative to the formal mode of classroom education provided in a normal school, college or university setting where the teachers/lecturers do the interaction with textual or electronic materials and then transfer their understanding of the text or electronic learning content to the students with demonstration which may be supported with teaching aids. In open/distance learning (ODL), the teacher reaches the learner with some well-prepared easy-to-understand, well-illustrated, excitingly illuminating and vividly explanatory self-instructing materials which may be textual or electronic. According to Braimoh (2010), the adoption of ODL in the world is a paradigm shift in the provision of higher education. He further opines that ODL provides the basis for access to higher education and for its mass coverage in Africa. Distance education/learning is the additional means of providing mass access to higher education by all, not only in Africa but the whole world. Braimoh posits that ODL is marked out by the fact that the learners are separated from their human instructor by both space and time. It involves several forms of interactions: between the learner and institutions, learner and learning materials in all forms, non-physical interaction between the learner and instructor, learner and learner, etc. It is noteworthy here that the learner is a principal factor in every form of these interactions.

There are some distinctions between open learning and distance learning. The difference is captured by the following definitions of the two similar but distinctive concepts which are sometimes used interchangeably. Distance learning is the process of education whereby a substantial chunk of teaching is done by someone far removed from the learners in space and, possibly, time; while open learning is

conducted in a manner that employs use of easy-to-understand teaching materials, whereby constraints on the learners in terms of access, entry, time and place, pace and method of study are minimized (Junaid 2010). This actually lies in the openness of Open Learning, while in Distance Learning, participants' graduation is regulated and it is often mass production as in the conventional mode of learning. Duration of open learning is not regulated in terms of time of entry and graduation, which is quite different from the distance learning mode. Dontwi, Amahia, Chukwu and Udomboso (2010) view both concepts as portending an approach to learning that is designed to reach the learners in the comfort of their homes, offices, shops or any other workplace. Reporting on the views on distance education, Onuka (2006) quoted Dohmen (1967) as seeing distance learning as a systematically organized form of self-study in which student counselling, the presentation of learning material and the securing and supervising of students' success is carried out by a team of teachers, each of whom has responsibilities. Furthermore, distance education is nothing but an arrangement for providing instruction through electronic communications media to persons engaged in planned learning in a place or at a time different from that of the instructor or instructors. Distance education as a concept has different meanings and interpretations to different people, thereby making it have variety of names from one region to another. Some regard it as formal education with the only difference being in the mode of training (Onuka 2009b).

It could be inferred from the views of scholars listed in this work that open and distance modes of learning represent approaches to learning whose foci are opening access to learning in all regards, including time and place, and providing flexible means of learning to individuals and groups of learners.

Junaid (2010) reports that distance education could also be seen as an alternative form of education legitimized by the general public as well as by those who allocate educational resources and opportunities. A critical issue in ODL is not necessarily the duration or whether it is a regular or in-service programme, but the fact that the individual who engages in other activities is allowed to participate in the programme.

It is pertinent to note that universities all over the world are faced with the challenge of inadequate space which in turn inhibits the expected access to educational opportunities, yet this development is not matched by the quantum of revenue accruing to higher education institutions to meet this astronomical increase in request of such spaces (Junaid 2010, paraphrasing Schott, Chernish, Dooley and Linder). This occurrence was believed to have caused universities to pay more attention to distance learning programmes. According to Onuka (2006), it was reported that there had been some form of agreement by almost all nations of the world to effect 'education for all' by 2015. One way by which this target can be achieved is through the distance learning mode. Hence, the nations

of the world have been formulating appropriate policies and feasible programmes to facilitate the realization of this laudable goal of providing education for all. This trend is in tandem with the observation of the Association for the Development of Education in Africa (ADEA) in its 2002 and 2003 reports (ADEA 2004) that in the face of the continuously increasing request for higher education spaces, funding of the sector in sub-Saharan Africa (SSA) has not, in real economic terms, matched such increase in demand for higher education, especially if cognizance is taken of the rate of inflation and devaluation of national currencies across the globe. Thus, the matter of provision of access to higher education via distance learning has become unprecedentedly acceptable by all nations of the world. In the opinion of Oludotun (2001) and Onuka (2006), any meaningful analysis of the goings-on in the Nigerian education sector, with reference to admission into tertiary institutions of learning, exposes the fact that there is a shortfall between demand for spaces in the universities and supply of such spaces for prospective candidates. They further observe that the most potent means of meeting the observed shortfall can only be through the open/distance learning alternative.

For Bunza (1997), conventional education is normally associated with being taught by a teacher who is physically present where the taught is also present, whereas open/distance learning is where the 'taught' do not, in most cases, have physical contact with the instructor. But distance education presupposes that students learn for at least a proportion of the time on their own in the absence of any teacher and, in most cases, far away from the teacher. Distance education is often meant for mature people, though technology and lack of adequate space has opened it to the young. Some elements regarded as essential characteristics of distance education, according to Junaid, quoting Maduka and Keegan respectively, are as follows:

- The separation of teacher and learner which distinguishes distance education from face-to-face learning;
- The influence of an educational organization which distinguishes it from private study;
- The use of technical media, usually printed materials to unite the teacher and learner, and carry the education context;
- The provision of two-way communication so that the students may benefit from or even initiate dialogue; and
- The possibility of occasional meetings for didactic and socialization process.

According to them, these characteristics form the foundation of a distance learning programme, particularly in the face of increasing technological change. Therefore, any distance learning programme which desires to keep abreast with time and

space must necessarily make use of modern information and communication technology that saves not only time but also life. It must be noted, however, that distance education has expanded across the length and breadth of the globe and is no longer in the periphery of the overall provision of education.

The emergence of distance education as a learning process is a turning point in the provision of mass education opportunities for millions of people whose educational aspirations and demands would not have been met by the conventional mode of providing education. Thus, it becomes necessary for the open and distance institutions to develop mechanism for two-way communication for teaching–learning, even in the use of instructional materials. From the various definitions, it can be inferred that the main essence of distance education is the mode of instruction which is made possible to the learner at a distance. The Nigerian National Policy on Education, FRN (2004) in Junaid (2010), as revised the fourth time, gives greater recognition to open and distance learning as an entire section of the document was devoted to it as to the other forms of education. The policy defines open and distance education as ‘the mode of teaching in which learners are removed in time and space from the teacher’. It further explains that open/distance learning ‘uses a variety of media and technologies to provide and /or improve access to good quality education for large numbers of learners wherever they may be’. All these definitions, notions or concepts have exposed the potency of open/distance learning in the provision of access to education, particularly to higher education in Nigeria.

Junaid (2010) reports that distance education technologies are expanding at an extremely rapid rate. Nonetheless, the need to ensure quality assurance measures, comparable to products of regular but similar university programmes, cannot be over-emphasized. She further reports that, resulting from the Houston University models are the creation of discrete learning objects developed by the faculty and delivered by various forms of technology (WebCT, video, audio, CD-Roms, PDFs, etc). The learning objects are thereafter managed within database so created and then customized, updated, revised and included in courses. This trend, by implication, portends that it cannot therefore overstress the need to employ modern information and communication to facilitate the process of providing access to higher education in the emerging economies. To ignore ICT’s use in promoting the ideals of ODL is to do so at the peril of its growth and development and, by extension, stunting the expansion of access to higher education and consequently stagnating national growth and development, since development is by man and man is developed through education. The distance teacher educator must be specially trained to adopt the teacher education curriculum, which itself must have been reviewed to suit distance teacher education, which again must be adaptable to the technologies required in teacher education delivery. In addition, all distance teacher educators must compulsorily take several courses in educational

technology to enable them teach methodology courses electronically in the simplest format that the unassisted learner can understand. They could be in the form of video and visual electronic materials, DVDs, CDs, internet, websites, blogs, etc., to reach learners in the comfort of their homes. This calls for constant power supply.

Practical Issues in ODL

Some practical issues include:

- ODL's marketability in the current knowledge commodity world;
- Putting in place formidable self-explanatory learning materials;
- Application of modern ICT facilities to enable learners access to instructional materials by self-effort;
- The application of contemporary evaluation techniques in ODL;
- Effective management of ODL;
- Provision of support service and counselling;
- Admissions process, record management and client services, etc.

There are quite a lot of practical issues in ODL in sub-Saharan Africa, typified by the Nigerian situation, apart from South Africa which appears to be advanced in running ODL. Some of these practical issues are highlighted below.

ODL's marketability in the current world's knowledge commodity: Knowledge commodity thrives well mostly under competitive market conditions. As such, whoever is providing knowledge must ensure that it is properly and appropriately packaged, advertized, with a total quality management approach to its operation; otherwise, such a knowledge provider will be out of market within a short time. This, according to Onuka (2005), is perhaps the reason why private institutions in Nigeria thrive much more than their public counterparts. If this is the case with other types of education providers, then ODL mode providers could expect to do much more, especially as not many people believe that the ODL model of higher education in Nigeria produces the same quality of graduates as its conventional mode counterpart. It must, therefore, be well managed and packaged towards a good proportion of the market, to keep afloat.

Management in ODL

Any reliable and dependable ODL must be in a position to administer its activities very well in order to ensure that its clientele receive the best of education away from the authors of its learning materials by making the materials simple to interact with and understood by the learner as much as possible, with very little or no assistance from anyone else apart from the materials. This is done through the training of course authors who should be remunerated to be assured of the

production of good, readable and marketable course materials that will attract more beneficiaries to the programme. It also entails that its programme managers are competent, skillful, client-friendly and capable of making its clients ready to assist in the selling of their programme in order to keep it afloat and attractive to prospective clients. Every distance learning programme must imbibe the spirit of evaluative management, possibly using some management evaluation model (Onuka 2010a) to constantly evaluate its programme management effectiveness for service delivery and client satisfaction, in the face of stiff competition from similar programmes. Imperatively, quite a lot of such programmes in the West African sub-region are sometimes ineffectively managed due to incompetence and lack of dedication on the part of those who are managing the programme. Programme management must be dynamic in line with technological changes.

Effective Management of ODL: Onuka (2010a) posits that effective management is an essential ingredient of a successful ODL the world over. Therefore, it is essential to take cognizance of those who possess the requisite management knowledge and skills before employing any into the management cadre of ODL programmes in sub-Saharan Africa. Onuka (2010b) further observes that, for management of ODL programmes to succeed, there must be constant evaluation of the management process. He then suggests what he terms ‘strategic management evaluation model (SMEM)’ which is based on the components that emerged from his definition of the term ‘management’ namely: forecasting, planning, budgeting, organizing, implementing/executing, monitoring/evaluation, feedback and programme/process revision for improvement. By implication, every aspect of the ODL management process be evaluated from time to time to minimize quality loss and optimize programme quality on a continuous basis; hence his proposition that all ODL programmes in Nigeria, and indeed all of Africa, should employ total quality management approach in their management because it is presently the most comprehensive management and takes cognizance of all components of the organization/institution – human and material.

Technologies in ODL Teacher Education

Essentially important is the fact that concrete and self-explanatory learning materials should be incorporated into the ODL teacher education programme. The various teacher education methodologies must be customized into the teacher education modules with vivid pictorial and motional illustrations, like the use of graphics and animation, in addition to other information and communication technologies like illustrative handsets such as blackberry, to make the instruction self-explanatory to the distance learner. This is because the trained teachers by both the distance learning and conventional modes are most likely to go into the same labour market and be employed in the same school system to teach children who will have to be assessed by uniform standards and undergo instructions under the

same syllabus. This portends that standards of imparting knowledge, attitude and skills must be the same for both modes. Presentation must however be different, so that the distance learners can at the end of the course be on the same pedestal with their counterparts trained through the conventional mode. The implication is that both textual and electronic materials must be more explicit and detailed for the distance learners with no teacher/lecturer at their side to assist them with the content and context of the text/learning materials. As pointed out earlier, ODL is technology and ICT-driven. Thus, the ODL teacher educator must be ICT-competent, if he would meet the needs of the modern ODL teacher education requirement in terms of instruction preparation and delivery, since it is the prepared learning materials that become the instructor with whom the learner frequently interacts, mostly without any form of external assistance. Thus, the technologically prepared instructional packages become representative of the instructor/facilitator in presenting the materials to the learners in such a way that they easily understand not only the content, concept and context but also the total import.

Evaluation in ODL

Evaluation in the ODL setting is two-fold: systemic/programme evaluation for, and of learning. In a workshop conducted by this author for the University of Ibadan Distance Learning Centre in 2008 on best evaluation practices in ODL, it was agreed that 'evaluating the distance learner could be in terms of his/her suitability, achievement, aptitude or in terms of the impact s/he is making at his/her place of work as result of his/her participation in the distance learning program' (Onuka 2009a:30; Onuka 2010c). This is because the essence of distance learning programme is to effect positive change in the knowledge, behaviour, attitude and skills of the participants in a predetermined direction to ensure that they are to themselves and the society by making positively remarkable contributions to the development of the community through their workplaces. However, as pointed out earlier, evaluating any of the above-listed attributes of the learner is only part of the evaluation needed to keep the programme going. Hence, with regard to the learner, we have evaluation for learning, which is what continuous assessment when properly and regularly conducted would do, as it provides feedback both to the programme (including its operators) and the participants for continuous quality improvement. This implies that, at regular intervals, systemic or programme evaluation is done as opposed to evaluating the learner which is partial and less comprehensive in that it concentrates on only infinitesimal aspects of the system. It needs to be stressed that the principal objective of systemic/programme evaluation is comprehensive system or programme revision for quality improvement. Until our university distance learning programmes realise and embark on this important programme management element, they will continue

to struggle to survive. In summary, it is noteworthy that evaluation and management go hand-in-hand. We, therefore, cannot divorce one from the other.

Admission Requirements

In ODL, the admission requirements could be made more flexible than the requirements for the conventional mode of education which is time-bound and does not require experience as a pre-requisite. This is because experience is actually a form of learning and acquisition of knowledge, attitudes and skills. If the ODL mode is meant to open up access to higher education, there is need for some clear distinction in the admission requirements for entry into the conventional mode and the ODL mode without necessarily lowering standards as what one may not have in terms of paper qualification may be possessed in terms of experience and maturity. According to Ayeni and Atanda (2010), studies have revealed that there is no discrimination in admission requirements for ODL and conventional modes, which runs counter to the principle of the ODL mode.

Provision of Support and Counselling Services

One of the essential services provided by ODL is learner support service and counselling. An experienced senior officer who is versed in the functions of ODL programme is usually assigned to assist the learners with all necessary information that will culminate in the success of the individual learners and the programme itself. Provision of these services to the ODL learners is compulsory, as it is invariably the only means by which these learners can tap the services of guidance in their educational pursuit as they have very little or no contact at all with the instructors. The programme operators appointed to do this work must be computer literate and available most of the twenty-four hours of the day. They must be patient, able to explain things in the simplest ways possible and their cellphones open all twenty-four hours of the day to attend to the learners.

Provision for People with Special Needs in ODL Programme

In ODL programme, there is the need to make provision for those with special needs in the preparation of the learning materials. Oyewumi and Olapegba (2010) observe that the issue of consideration for people with special needs has not been taken seriously by programme operators in sub-Saharan Africa, particularly in the West African sub-region. They advocate that all persons, irrespective of their special state, should be educated and accommodated in the learning process for their individual and societal emancipation. They further assert that ODL provides access and opportunities to higher education for all, in all ramifications, irrespective of people's deficiencies. Therefore, if a particular segment of the populace is denied access to education through the mode, then its purpose would be defeated, hence the need to take cognizance of these sets of persons in the

preparation and delivery of instructions through this mode becomes imperative. The deaf and dumb, the visually impaired (whether partially or totally), the intellectually slow persons, etc. must all be provided for. The dynamism of everything on this planet also affects the mode, since the only permanent thing is change. The mode must therefore factor in the change element for all its activities, irrespective of the state of the learner.

Collaboration as an Essential in ODL

Collaboration is a synergy, and it culminates in greater success. In fact, synergy is known as '2+2=5 and not 4', in order to emphasize its contribution and value to organizational/institutional achievements. So, ODL cannot be an exemption. There must be inter-ODL programme collaboration for greater access in sub-Saharan Africa. There are several ways in which this collaboration can take place: training, material development, technology, exchange of facilities, jointly- organized workshops and conferences, joint professional association, ICT facilities, internet centres and common interaction centres both within and across borders. Jhansi and Mishra (2010) highlight several ways through which university distance learning programmes in India could collaborate with others, using available synergies at their disposal for profitable distance learning productivity. Among the areas of collaboration are:

- Administration;
- Advertising;
- Certification;
- Curriculum Design;
- ICTs/Network;
- Evaluation;
- Library Support;
- Learners' Admission/Selection;
- Learner Support/Academic Counselling;

The programmes can cooperate in building mass ICT centres across the nation, whereby participants residing in each area, irrespective of which university programme they belong to, can make use of the facilities. They can jointly advertise for admission and possibly develop a common method of processing the admission, common library support services in various towns for use by programme participants across the nation and across borders of nations within the African continent. This trend will make their programmes and outputs international and thus globally recognized and accepted. The collaboration which could be in all or some areas of ODL can consequently enjoy synergistic benefits

by ways of cost minimization in the admission process, staff recruitment, etc., while avoiding duplication of efforts in library services provision, counselling support, as well as administrative and logistic support.

Joint ownership of certain facilities in centres across a nation or region would not compromise either quality or independence of each university ODL. Rather, it will bring about higher standards and result in interdependence in the utilization of facilities and equipment, thereby simultaneously increasing their profit margins and self-sustenance while minimizing the cost of mass coverage of higher education in the third world.

Power Supply

The issue of incessant power outage in Nigeria in particular and perhaps a few other countries in Africa can hardly encourage the ODL mode in promoting access to education on the continent. It is a known fact that irregular power supply or constant power outage is a hindrance to effective distance learning programmes or any educational programme for that matter (Onuka, Adewale and Ajayi 2007), and the teacher education component cannot be different.

Theoretical Explanation of Issues

In teacher education, there are various methods and theories of teaching or instruction delivery. Some are classroom-specific, and some are adaptable in the ODL situation, while some are not. According to Abdul-Haqq (1998), constructivism theory of teacher education presupposes a learning, meaning-making theory, which offers an explanation of the nature of knowledge and how humans acquire learning. Constructivism theory seems to perfectly fit into the distance learning mode of teacher education. The principle underlying constructivism is electronic media-compliant and can thus be easily utilized in ODL teacher education programme. Wikipedia views teacher education as 'continuing professional development'. This view makes teacher education amenable to the ODL mode of imparting knowledge, attitudes and skills to the learner. Taking cognizance of the constructivism theory of teacher education, it becomes imperative that the ODL mode of teacher education employs all the issues outlined above or takes account of them in implementing the ODL mode of teacher education with in-built quality assurance mechanisms. Boger-Mehall (undated) also supports constructivism as a good theory which promotes teacher education and concludes that the theory is fully supported by the cognitive flexibility theory which, as its name implies, promotes flexibility in teaching and teacher education, thus fitting very well into the ODL teacher education mode. The techniques in the ODL mode must be flexible to give people who otherwise would have been left out of the acquisition of education the requisite teacher

education through the mode, as ODL was primarily a second-chance opportunity, though in the Nigerian context, there is now a paradigm shift.

Quoting Sherry (1996), Junaid (2010) states that distance education technologies are increasingly expanding at an extremely fast rate. Nevertheless, the need to ensure that quality assurance measures are in place cannot be ignored, if high quality comparable to products of conventional mode were to be maintained. The University of Houston's Distance Learning, in its effort to assure quality, evolved database models for course design and course delivery that was to facilitate the highest level of quality teaching and learning environment (reported in Junaid 2010a). The models were meant to create discrete learning objects designed and developed by the faculty and delivered in various forms of technology (WebCT, video, audio, CD-Roms, PDFs, etc.). These objects were then managed within databases so created and customized, updated, revised and included in courses. This shows that collaboration is essential, especially in recognizing the fact that Africa still lags behind the other continents in technological development. Synergy in these areas would likely ensure greater level of success than if each of these programmes were run independently. Studies have revealed that effective leadership, management and supervision are supportive of learning performance (Onuka 2006; Akorede and Onuka 2008; Odinko 2010). The implication is that every issue discussed earlier is relevant in moving the ODL teacher education mode to the next level in our context, and must thus be incorporated into the daily operation of ODL mode of higher education provision. Teacher education theories presuppose that teaching includes the evaluation of the teacher, teaching/instruction and learning for generic systemic and learning improvement (Singh and Nath 2007; Onuka 2009b). Thus, one can conclude that teaching/learning without internally in-built evaluation system is like a body without a head and therefore an incomplete exercise, whose objective may be far from being achieved.

Various studies have been conducted on improving operations of the Nigerian university ODL system in its various aspects and the findings include: total quality management in an ODL outfit could improve its management and attract more participants (Onuka 2006); attitude of students and staff also affect their choice of distance learning programme (Onuka 2006); the way a programme is handled by its managers affects the way students perceive its challenges, prospects and viability (Onuka 2009c); contemporary evaluation mechanism can enhance the quality of its programme and products (Durowoju, Onuka and Onabamiro 2010); good client relationship and service delivery promotes enrolment into ODL programmes (Odinko 2010); many areas of improvement need to be attended to by ODL programmes in Nigeria if they are to continue to increase their enrolments (Junaid 2010b); there is need for provision in ODL courses for people with special needs, that is, those with challenges (Oyewumi and Olapegba

2010); age, sex and place contribute to the academic performance of the distance learner; and the learner needs to imbibe the spirit of time management for better performance (Onuka 2011). These reveal the level of importance that scholars attach to the role of ODL in promoting teacher education in particular and the ODL mode in general. The foregoing implies that the role of ODL in the twenty-first century in higher education provision is very clear and unambiguous. Since theories on teacher education provide the basis of mechanism for optimizing the teaching/learning encounter in order to accomplish the ideal situation for maximizing learning experiences and learning outcomes, ODL teacher education must de-emphasize teaching in favour of learning where the paradigm has shifted (Onuka 2009b). ODL teacher education methodologies must have evaluation for, and of learning in-built into it. Singh and Nath (2007) believe teaching and teaching methodology should be subject to constant evaluation for consistent improvement of learning. This can only be so in the ODL teacher education mode through evaluation of the textual and electronic learning materials, which are expected to be more explanatory, taking note of the fact that there are differential rates of learning by the distance learners.

Conclusion

This chapter has outlined some of the principles involved in the ODL mode of teacher education and the practices in the developing countries, with specific mention of the Nigerian university ODL programmes. Though no specific reference to the National Open University of Nigeria is made in the study, its system of operation is not significantly different from what obtains in those that had been in existence before it, except that the mandate it has is to provide university education through the ODL mode only. The inference that can be made from what is on the ground, in terms of translating ODL theory or principles to practice, is that much still needs to be done to bring the practices up to global standards. This implies that the power sector of our economies in the developing countries needs to catch up with the rest of the world in terms of constant power supply (possibly 24 hours a day and seven days a week), if we are to operate our ODL at the optimal level. There must be deliberate efforts at paradigm shift from classroom type of ODL practices to virtual (electronic) forms of ODL teacher education provision. ODL teacher education practices are yet to conform to global standards in which animation, power and electronic methods of instruction presentations are the order of the day.

Therefore, it becomes imperative that the ODL teacher education mode be well-packaged for marketability so that its clientele base will not only be sustained but also continuously improved. It must also be well-managed in all ramifications: the admission process, evaluation, its information base and its staffing, among others, must be managed in a manner that conforms to the total quality

management approach. Modern electronic teacher education technologies must be developed, applied and constantly improved in such a way that teacher education instructional delivery in the ODL mode will be self-explanatory and the ODL learner will understand contents of instruction and their intents and import without any need for serious assistance from anyone. Evaluation in every aspect of ODL should be seen as essential and expedient for programme improvement and sustainability. Learning support should be given to students so that they do not need to frequently visit the operational base of any particular ODL programme. Counselling support is also essential and expedient to the successful operation of ODL programmes. In like manner, any ODL programme craving for success and sustainability must give prominence to collaborative efforts with similar other programmes to enhance better efficiency in financial and other resource management through optimization of programme cost-benefits. An ODL must also, as part of its social responsibility, ensure that people with special needs are taken into consideration in its programme design, development and execution.

ODL programmes should develop synergy in the provision of power, library and internet services, for interactions among their programme participants in their various locations through the length and breadth of the third world for mass human resource production and operational cost reduction. Finally, efforts should be made to translate as much of the theories of ODL as possible into practice, to minimize waste of energy, time and funds on the part of participants with regard to travelling, while the technology of learning material production and distribution should be improved to ensure prompt production and delivery of materials to learners wherever they are. In this way, collaboration through the utilization of comparative advantage to enhance cost-minimization and benefit-maximization becomes imperative in the operations of ODL programmes in Africa and the entire developing economies of the world.

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6

Teacher Education in South Africa: Issues and Challenges

Meshach B. Ogunniyi and E. Mushayikwa

Introduction

In his book, *Democracy and Education*, Dewey (1946) contends that education, in its broadest sense, is the means to social continuity in life. It is through the educative process that the younger members of a given society are initiated into the ideals, interests, values, purposes, information, skills and practices of the older members; otherwise that society might cease its characteristic life. Whichever way we look at it, education is a powerful means to transform and sustain society. It is a reliable agency of change and an effective means to social mobility, survival and adaptability. In other words, without the educative process, a society faces the possibility of extinction.

According to Archambault (1974), Dewey's philosophy of education revolves around four major issues: (1) the aim of education; (2) the agent responsible for communicating the aim of education (the teacher); (3) the subject who needs to understand that aim (learner); and (4) the means by which it is achieved (curriculum and instruction). Our focus in this chapter is on the second issue, namely the teacher and how he/she is trained to fulfil his/her role within an education system generally and in South Africa in particular.

In most countries, changes in society have usually evoked demands for reforms, and South Africa is no exception. Since the inception of a democratically elected government in South Africa in 1994, calls for reform of the education sector have by no means abated. Major changes in education in South Africa have occurred in response to historical, social, political and economic circumstances in which the country has found itself. As in other countries, educational reforms in South Africa reflect significant periods of history: the colonial era (1800s-1940s);

the apartheid era (1950s-1994); and since 1994 when the first non-racial democratic election was conducted and the first black president came to power. The imperatives, among others, for the new government, according to Sibusiso Bengu (1995) were diverse, but top on the list were: the mandate to create a truly national system of education and training; the need to redress the inequity of the past where schools for the white minority had a well-resourced learning environment, compared to the poorly staffed and underfunded black schools; the need to overhaul and transform the entire education system; and the need to expand learning opportunities for all. This was inevitable because the education system existing before 1994 in South Africa was not only parochial, unjust, abnormal and exclusivist in nature; it was also inadequate for the basic requirements of democracy and incompatible with the postulates and aspirations of a people imbued with hopes for a better life for all.

There exists a vast amount of literature on teacher education in South Africa. It is therefore inconceivable to attempt to treat this in detail in a single short chapter as this. Nevertheless, it is hoped that issues addressed in the chapter would at least provide a miniscule picture of this all-important subject. For ease of reference, the issues have been addressed under the following sub-headings:

- Transformation in the Education System;
- Historical Overview of Teacher Education in South Africa;
- Establishment of a Single Ministry of Education;
- The Development and Establishment of a National Qualification Framework (NQF);
- Curriculum Reform as Part of Transformation;
- Mergers of Education and Training Institutions;
- Impact of Transformation on Teacher Education;
- Conclusion.

Transformation in the Education System

According to Leonard (2004), social critical theory construes education as the means through which societal hopes, aspirations, values and mores are transmitted from one generation to another. However, these values and ideals often mirror the aspirations of the privileged ruling class rather than what would have benefited all the diverse members of that society. For example, during the apartheid era, South Africa had nineteen different education departments to cater for the perceived needs of the various cultural groups (Gordon 2009). Each department managed, so to speak, its own affairs. In addition, there existed in each department a dual educational system – a mainstream and a special education component. Even in the latter, schools for the white disabled learners were better resourced than those for the non-whites.

According to Johannes (2006), apartheid laws and policies, underpinned by the medical model of disability, have succeeded in excluding black learners with disabilities from pursuing careers in the scientific engineering fields. That functional limitation model locates the problems of disability in terms of individual rather than social construct. Based on this view, physically challenged learners have often been isolated in specialized learning environments with little opportunities to maximize their potentials. However, in 2001, the Department of Education (DOE) in its Education White Paper 6 designated “Special Needs Education” spelling out quite succinctly an inclusive education and training system that signalled the move away from the medical to the social model of disability. The medical model of disability focuses on the physical as well as perceived limitations imposed on the handicapped person while the social model focuses on the potential of the handicapped person to perform tasks beyond such limitations when accorded the opportunity and the encouragement to do so. In other words, disability is not only a physical handicap; it is a social construct imposed by society and reinforced by both tangible and intangible contexts within which the disabled person is allowed to function. The consequence of negative perception of disability by society is perhaps more disabling for the handicapped person than is often realized.

The results of decades of segregation and systematic under-resourcing have, therefore, depicted the South Africa education system as a motley assembly of diverse characterizations of the semblance of a court jester. But these jaundiced educational sub-structures created not only an administrative nightmare but bizarre cabaret- cum-slum education systems, with all kinds of products, ranging from the highly trained and skilled white personnel to largely servile and unskilled black labour occupying the lowest rung of the economic ladder. After independence in 1994, the new democratic and populist government had no alternative but to formulate policies that would eradicate the grotesque imbalances that characterized the educational landscape of South Africa. This implied a replacement of the largely exclusivist apartheid system of education with an inclusive one based on the principle of equity and justice for all. In this regard, the Education White Paper 6 (DOE 2001) was drafted in recognition of the fact that all South African learners, regardless of their physical limitations, are able to learn and have equal opportunities to pursue their intellectual interests. In addition, the transformation process begun in 1994 necessitated overhauling the whole education system, from its multiple representations and unwieldy bureaucracy to a single coherent system which catered for all socio-cultural groups in South Africa. As a result, the South African education system can be said to have undergone tremendous reform and transformation in the fifteen years since the demise of apartheid.

The aim of this chapter is to examine critically the impact of the changes that have taken place in the South African education system, as a way to understand the challenges faced by teacher educators. To better understand these changes, the

next section will focus on the historical development of the new education system in South Africa, highlighting the major transformations as:

- a. The reformation and rationalization of education departments into a single and unified entity or ministry;
- b. The development of a single, unified national qualifications framework for education, providing a continuum of credits for achievement from kindergarten to doctoral qualifications;
- c. The adoption of an outcomes-based philosophy and a single, unified national curriculum for the nation's schools; and
- d. The rationalization of higher education institutions (universities and colleges) from more than 240 in the late 1980s, to 23 universities by 2008 (Gordon 2009).

These changes and related developments had far-reaching effects on the teacher education system in South Africa. The next section examines the impact that implementing these changes has had on teacher education. The last section briefly summarizes the literature review and concludes by suggesting some recommendations on the way forward.

Historical Overview of Teacher Education in South Africa

As indicated earlier, the education system in South Africa was structured along racial lines. The white supremacist governments poured immense resources into the education of white learners, while Indian, coloured and black learners were accorded lesser resources, ranging from about two-thirds for the Indians to about one-quarter for the black African learners respectively. In other words, the apartheid government established fragmented education departments, with varying access to resources for the white and non-white learners. Furthermore, most white teachers received pre- and in-service training at well-resourced urban universities, while most black teachers started teaching without even completing their own secondary schooling, let alone the tertiary education that they needed (Keevey 2005). Mission schools provided training for the bulk of the African teachers, who were expected to teach in primary schools.

The situation was further complicated with the entrenchment of the Nationalist Party's apartheid policies in the 1960s and the creation of Bantustans. Thirty-six semi-autonomous universities and technikons provided teacher education along racial lines for mainly white, coloured and Indian teachers, whereas black teachers were trained in Bantustan-based colleges and universities. It is estimated that by 1994, there were more than 120 primary teachers' colleges within the Bantustans alone. Moreover, the stringent controls imposed by the Homeland Department of Education (DET) ensured that Bantustan-based colleges operated more like secondary schools, rather than as tertiary institutions (Gordon 2009).

The rapid political changes of the 1990s had significant impact on the education system in South Africa. For instance, in 1990, it provided significant landmarks. However, in the aftermath of the 1976 Soweto uprising, the South African education system faced increased pressure for transformation from the international community. The National Education Initiative (NEI 1988-1992) was established by the National Education Co-ordinating Committee (NECC), to raise debate on educational policy for a future democratic South Africa. However, NEI was a reformist initiative, focusing mainly on capacity building, rather than transformation.

In 1993, the Centre for Education Policy Development was established to prepare new educational policies for a post-apartheid South Africa. Following wide-ranging consultations with stakeholders, an agreement was reached, which placed educational transformation at the center of educational reform. There was recognition that the legacy of apartheid would be deep and far-reaching; therefore educational transformation would be expected to take time. For example, it was understood that merely expanding the education system and opening access to previously excluded Africans would not solve the debilitating legacy of apartheid. With the coming of a new political dispensation in South Africa in 1994, these developments towards educational reformation set in motion significant systemic transformations identified by the ruling African National Congress as necessary to systematically redress the inequalities that apartheid had conceived. Some of the key transformations were as outlined below.

The Establishment of a Single Ministry of Education

In 1994, the ANC published the Yellow Book, which was entitled, *A Policy Framework for Education and Training*. In this publication, the ANC government took central responsibility for developing and implementing a unitary national education system, managed by a Ministry of Education and Training. Under this policy, all higher education and training institutions (teachers's colleges, universities and technikons) would fall under the same national system of higher education 'to ensure unity of purpose and standards across the sector' (Gordon 2009:15). The focus was on de-segregation and expanding access to institutions of higher education for the previously disadvantaged groups. However, under this policy alone, the higher education institutions (HEIs) responsible for teacher education retained their structure, hierarchy and exclusivity. For example, traditionally 'white' universities continued to attract predominantly white student teachers and continued to marginalize or exclude the other races through a variety of policies and hierarchical selection procedures. Thus, unifying the education system on its own was not enough to bring about transformation.

The Development and Establishment of a National Qualifications Framework (NQF)

Previous apartheid governments had used education as a tool for repression (*Business Day*, 10 October 1996). For example, the National Party used educational segregation as a means to exclude blacks from full participation in the economic development of the country. Under the pro-democracy ANC government, however, a single education system was no guarantee for benchmarking qualifications, especially as the HEIs remained largely autonomous in their dispensation. There was a need to develop a home-grown system of benchmarking qualifications and developing standards that could be applied across all the institutions of higher learning. In 1995, a national qualifications framework was developed to, among other things:

...provide a set of principles and guidelines by which records of learner achievements are registered to enable recognition of acquired skills and knowledge, and thereby using an integrated system that encourages lifelong learning (SAQA 2000:1).

For the ANC, the NQF was more than just a qualifications harmonization tool. It was deemed to have a particular transformative purpose, as reflected in the five NQF objectives below:

- Create an integrated national framework for learning achievements;
- Facilitate access to and mobility and progression within education, training and career paths;
- Enhance the quality of education and training;
- Accelerate the redress of past unfair discrimination in education, training and employment opportunities;
- Contribute to the full personal development of each learner and the social and economic development of the nation at large (SAQA 2000).

Through the NQF, it was possible to provide alternate pathways to acquiring skills, thus providing hope of economic redress for previously disadvantaged groups, by way of further training. For example, in 1994, a significant component of the teaching work force was either under-qualified or not qualified. In many cases, teachers had no professional qualifications or had limited subject-specific training, as noted by Mays (2004). Through the provisions of the NQF, under-qualified and unqualified teachers could acquire the same professional skills through in-service training. Various bridging and upgrading qualifications, e.g. medium-term national programmes, such as the National Professional Diploma in Education (NPDE) (Welch 2001) and Advanced Certificate in Education (ACE) courses were developed to give such teachers accelerated access to further and

higher education and training. Thus, the NQF was seen as a transformation tool: 'It promised much when progressive forces could think of no coherent and feasible alternative response to the new challenges of power in the era of globalization and the aftermath of apartheid' (McGrath 1997:181).

Introduction of a New Schooling Curriculum

As part of its transformation agenda, the new ANC government also set out to develop a new curriculum in 1994, tagged Curriculum 2005, with the intention of having it fully implemented by 2005. Curriculum 2005 (C2005), henceforth the new curriculum, was underpinned by the constructivist philosophy, which placed responsibility for learning on the learners themselves, with teachers serving as facilitators. The new curriculum has had to be revised a couple of times when it was found to be placing too heavy an administrative burden on teachers. Besides, the national system was not able to provide adequate and timely in-service education and training (INSET) to alleviate this pressure on teachers. However, throughout the revisions, the Department of Education has resolutely remained committed to the underlying principles on which the new curriculum is based. Indeed, the new curriculum is due for another major review to make it more responsive to the education needs of South Africa. Preparations are being made to set up working committees and a reference committee to consult with these working committees.

Deliberative curriculum theory holds that the stakeholders who are invested in the development of a particular curriculum should engage in the development process through a process of mutual deliberation (Curry 1992). The new curriculum has caused much controversy amongst stakeholders, especially the teachers, probably because of the top-down approach in which the curriculum was implemented. For example, teachers who were expected to implement the new curriculum (that required a radically different instructional approach from usual) were neither adequately equipped with the necessary instructional skills nor told why the existing curriculum was to be replaced by a new one (Jansen and Christie 1999; Ogunniyi 1997). The curriculum for the natural sciences presents a vivid illustration of this top-down approach.

Two main reasons given in the new curriculum for the need to introduce indigenous knowledge systems (IKS) into the science classroom are that: (1) IKS reflect the wisdom about the environment developed over the centuries by the inhabitants of South Africa; and (2) much of this valuable wisdom believed to have been lost in the last 300 years of colonization now needs to be rediscovered and utilized to improve the quality of life of all South Africans. The attempt to include IKS within the science curriculum is not unique to South Africa. Similar attempts have been made in many other African countries, Canada, USA, Australia, the Middle and Far East, as well as Central and South American countries (Garrouette 1999; Michie and Linkson 2005; Nichol and Robinson 2000).

In their rebuttal of the statement made by Cobern and Loving (2001) that school science should exclude most, if not all, of IKS in the way that it excludes the social sciences and humanities, Corsiglia and Snively (2001) argue that indigenous science offers knowledge that modern western science has not yet learned to produce. They contend further that the current environmental crisis largely caused by scientific and technological activities has forced many scientists to pay increased attention to how to ameliorate the situation through traditional environmental knowledge. There is nothing radically wrong in including certain indigenous knowledge (especially those processes with scientific basis) within school science but this presupposes that the teachers have the necessary knowledge or skills to do this. As it turned out to be, most science teachers were abysmally ignorant of what indigenous knowledge (IK) entails.

Whatever might be the justification for integrating science with IK, science teachers' opposition to the new curriculum includes, among others, the fact that: (1) science teachers have been schooled largely in western science and hence are more familiar with that worldview than with IKS; (2) the new curriculum demands new instructional approaches and goals in terms of contextualization and indigenization but that this contradicts the countless assessment protocols associated with the new curriculum; (3) the lack of consultation by the curriculum planners seem to under-rate teachers' role in curriculum planning and implementation; and (4) there is lack of clarity on how a science-IKS curriculum could be implemented (Jensen and Christie 1999; Ogunniyi 1997). As Simon et al (2006) have pointed out, a curriculum which emphasizes alternative goals for classroom pedagogy in a context where conceptual goals predominate is notoriously difficult to implement unless a well-planned and supportive teacher training programme is in place.

It was because of the top-down curriculum approach that Jansen (1997) states, unequivocally, ten reasons why C2005 would fail, as follows:

- The language of the new curriculum is eminently too complex, confusing and sometimes contradictory;
- It is underpinned with the questionable assumption that curriculum development is directly related or automatically implies socio-economic development of South Africa;
- It is based on the false assumption that classroom organizational set-up and transactions, as well as well-trained teachers needed to implement such a sophisticated curriculum exist within the education system; outcomes couched in cognitive terms would automatically transform the dominant behaviourist teacher-centered instructional practices into learner-centered approaches or that competence-based instruction is easily amenable to behaviourally structured assessment protocols;

- The contradiction inherent in advancing specific outcomes in all disciplines or contexts, even in settings where aesthetic values are much more appropriate than the mere demonstration of a given knowledge or skill;
- The capitulation of the ruling party, the ANC, whose ideological stance and political history stemmed from process and dialogues to enacting a policy whose focus was based on pre-determined educational outcomes;
- The instrumentalist view of what learners can demonstrate, given a set of outcomes at the expense of other important values derivable from the curriculum;
- The extra administrative and management burdens placed on schools and teachers in the implementation of an outcomes-based curriculum;
- The trivialization, atomization and fragmentation of curriculum content in pursuit of linear, step-wise and discrete competencies or esoteric outcomes;
- The lack of trained teachers in the face of implementing a curriculum which demands radically different or competence-based assessment strategies and complex systemic reforms;
- The lack of awareness of the curriculum planners of the stranglehold effect of assessment on the entire education system in South Africa.

Besides the above reasons, the new curriculum was introduced at a time when the education system was still reeling from a plethora of reforms, as described above. In addition, individual teachers, many of whom were products of the old apartheid education system, all of a sudden found themselves having to implement a curriculum that required of them a completely new way of thinking and relating to learners. To make matters worse, there was very little support in terms of resources, and even in the tertiary education institutions, few understood the demands of the new curriculum. Critics of the new curriculum argue that the national curriculum was introduced too early and without adequate preparation (Baxen 2001). As will be seen later, the introduction of the new curriculum has had far-reaching effects on teacher education.

Mergers of Education and Training Institutions

Another legacy of the apartheid government was a plethora of education and training institutions distributed all over South Africa. A national teacher education audit carried out in 1994-1995 had revealed that the existing teacher training system was fragmented as there was no collaboration between the many different education systems and institutions (Hofmeyr and Hall 1996). Concerns were raised regarding the quality and relevance of the teacher education programmes being provided by these colleges. It was therefore decided to improve the effectiveness of the system by merging a number of universities and technikons and incorporating teacher training colleges into universities and universities of technology.

Following the incorporation of teachers' colleges, all teacher education became located in higher education. Kruss (2007) has identified three major trajectories by which ITE institutions have been restructured; i.e. by incorporation of teachers colleges, internal restructuring and mergers with other institutions. Restructuring has had the effect of reducing the number of formal universities from 35 in 2001 to 23 in 2006. Moreover, faculties of education, being least rated in terms of funding priorities and research outputs, were frequently casualties of internal restructuring, with several being downgraded from faculty to department or school status.

The Impact of Educational Transformation on Teacher Education

The transformation of the South African education system has had several knock-on effects on the training of teachers. As already mentioned, educational transformation took place amid a sense of overwhelming urgency to escape from the legacy of apartheid. Changes in the education system occurred in rapid succession and at various levels in terms of the National Qualifications Framework for the new curriculum and the rationalization and mergers of higher education – all of which occurred almost simultaneously. The combined effects of these systemic changes are summarized as follows:

Increasing access to opportunities for under-qualified teachers to upgrade: The new curriculum encompassed a philosophical framework that was completely different from the traditional approaches to teaching that had been in evidence during the apartheid era. As a result, teacher education institutions found themselves presented with a new challenge – to provide content up-skilling and pedagogical support to teachers in the field (in-service). The National Qualifications Framework provided a unified qualification framework with multiple entry points. This ensured that under-qualified teachers in the field could upgrade and earn higher qualifications whilst on the job. This alternative pathways option acts as an incentive for lifelong learning. Keevey (2005) identifies three pathways to higher education qualifications available to teachers:

- a. Earning SAQA credits through in-service short courses (ACE, other SAQA-accredited in-set short courses, leading to an ACE equivalent);
- b. Earning credits through upgrading and bridging courses (e.g. NPDE);
- c. Formal Initial Professional Education and Training (IPET) courses (B.Ed or a first degree plus an Advanced Diploma in Education).

The new National Policy Framework on Teacher Education and Development which has also been endorsed by the South African Council of Educators (SACE) recognizes and entrenches these pathways into education policy – thus creating a teacher professional development continuum from IPET to CPTD. Multiple professional development pathways enable teachers to take responsibility for

their professional and career development. This also implies that teacher training institutions have to be versatile and flexible, so that they offer services that meet the varied needs of the teachers. However, it is envisaged that SACE, as the principal body responsible for registering teachers as professionals, will develop professional and competence standards that will be used to regulate the teacher education career path continuum (SACE 2007)

Provision of Professional Development Incentives

In order to support multiple pathways to qualifications, funds need to be made available to support teacher career progression. While the government has provided generously towards in-service and upgrading support, funding for initial teacher education has been inadequate (Ministry of Education 2004). The end result has been that certain ITE institutions have had to reduce student teacher intakes, or cease ITE programmes altogether, to focus on higher degrees. Funding subsidies within higher education institutions have likewise been low for education. Gordon (2009) argues that by under-investing in teacher education, the government is shooting itself in the foot. Other researchers (Parker and Adler 2005; ELRC 2005) had already warned of a potential shortage of teachers in critical areas and phases by 2011. On the other hand, SACE insists that the Government, as major employer of professional teachers, should make adequate provision of funding for both IPET and CPTD pathways.

Teacher Supply, Demand and Attrition

At the same time that changes were being introduced into the structure and function of the education system, the demography of schooling underwent further transformation, mainly because of the improved democratic space and opportunities. The opening up of the economy meant more opportunities were now available for previously disadvantaged groups to participate in the economy of the country. As a result, anecdotal reports in the late 1990s increasingly indicated that large numbers of teachers were leaving the profession.

Apart from the gross indiscipline among learners, the chaotic nature and the general breakdown of the learning culture in many schools and the impact of HIV/AIDS on the teaching population are other matters which warrant a more comprehensive study than space would allow in this chapter. Nevertheless, concerns have been expressed by individuals, government and the public at large about the high level of absenteeism and attrition rate among teachers, particularly in the township and rural schools. All these factors have not only lowered teachers' morale; they have also impacted negatively on the quality of teaching and learning taking place at school. The mass exodus of experienced teachers from the education system (galvanized by the ill-advised retrenchment saga of 1995) has not only done irreparable damage to the reform process, but has also made teaching unattractive to the population of youth now attending higher institutions in South Africa.

In 1997, the Education Labour Relations Council (ELRC 2005) initiated a research to determine the supply, demand and attrition trends for the education sector. The resulting comprehensive report has since established the following key realities pertaining to the South African educational environment:

- a. The potential learner population (ages 6 – 18) has been increasing steadily between 1999 and 2003;
- b. Actual learner enrolment has somewhat decreased over the same period. However, the decline has been attributed to more effective teaching, leading to improved throughput (less learners repeating grades), and general increase of vulnerability among learners (e.g. girls), leading to increased restricted access to schooling;
- c. The teacher-learner ratio remained stable at 35:1 for both primary and secondary phases (i.e. lower than the DOE target of 40:1 for primary and 35:1 for secondary teachers);
- d. 29 per cent of active teachers are older than 45 years of age, compared to 21 per cent of the general labour force. Thus, the teaching profession has generally older manpower than the other professions;
- e. Teachers appear to be generally less healthy than other workers, with more incidences of absence due to stress-related illness being reported, compared to the other professions (e.g. nursing);
- f. More than a half (54%) of the teachers surveyed reported job dissatisfaction and thought of leaving the profession. The incidence was much higher among younger teachers (29 – 39 age group). In addition, 66 per cent of dissatisfied teachers worked in the sciences, technology, commerce and business studies areas;
- g. The survey found that reliable predictors of job dissatisfaction were:
 - i. Race – Whites, coloured and Indians tended to be more dissatisfied with teaching than black Africans;
 - ii. Teaching Experience – Younger teachers tended to want to leave the profession;
 - iii. Lack of Career Advancement – Most teachers who thought of leaving were frustrated because they could not advance or get promotion;
 - iv. Recognition – Other teachers felt that teaching effort was un-rewarding;
 - v. Teaching conditions – Teachers also complained of being overworked, with too much administration and less support.

Linked to these harsh realities, some researchers (Gordon 2009; Paterson and Arends 2007) have tried to identify the supply, demand and attrition trends as experienced in the last ten years. Table 6.1 below summarizes their findings:

Table 6. 1: Teacher Supply, Demand and Attrition Trends

Supply Trends	Demand Trends	Attrition Trends
<p>Fewer younger teachers are enrolling into IPET courses; Universities are producing approximately 9,000 teachers per year. Distance Education (UNISA) contributes approximately a half of the enrolments.</p> <p>Enrolment numbers for black Africans has declined in recent years and this has been attributed to greater access to black empowerment in other areas.</p>	<p>South Africa requires approximately 15,000 teachers annually to replace resigning teachers and 6,000 teachers are required annually as substitutes for extended leave (e.g maternity)</p> <p>Teachers' pool (unemployed teachers) has declined sharply, meaning that future employment of teachers will depend more on the availability of newly qualified teachers.</p> <p>There is a predicted shortfall of 15,000 teachers by 2008, using the current teacher–learner ratios of 1:40 (p) and 1:35 (s). This shortfall increases to 32,000 if a ratio of 1:35 is considered for all phases.</p>	<p>The total teacher population in public schools has declined by -5.3% (from 387,000 in 1997 to 366,000 in 2003). Resignations account for 53% of all terminations</p> <p>Retirements account for 66% of older teachers (55 + years) attrition rates. Resignations account for 80% of young 3,0teachers (25-34 years old) attrition rates.</p> <p>Permanent teacher numbers have remained stable, but contract and temporary staff numbers have declined by 44%. Decline is to the assimilation of contract staff into permanent positions.</p> <p>4. Gross attrition has been rising steadily over the years, peaking at around 6%. Attrition due to mortality has jumped from 7% in 1997 to 17% in 2003</p> <p>Teacher mortality is third largest attention factor.</p> <p>The rise in mortality rate is attributed to HIV related illnesses and peaks between the ages 25 – 44</p>

The changes depicted in Table 6.1 above and related developments have had far-reaching effects on teacher education in South Africa. Apart from the significant rate of attrition due to a number of socio-economic factors, the current devastating impact of the HIV/AIDS pandemic, especially among black South African teachers, cannot be easily discounted. However, this worldwide phenomenon is worthy of fuller treatment than space would allow in this chapter. Table 1 also shows that the education system in South Africa is bleeding and, if the trend continues, there will be huge shortages of teachers. While school-level remedies have been suggested (Delannov 2008; ELRC 2005), these remedies were more concerned with raising the profile of the profession and increasing its attractiveness. However, at the supply side, the Ministerial Committee on Teacher Education (2005) has recommended that teacher education institutions can also play their part through:

- a. Providing upgrading and broadening skills bases to enable teachers to progress within their careers;
- b. Providing practical training and mentorship to newly qualified teachers to reduce stress and frustrations resulting from inadequate pedagogy and content skills;
- c. Facilitating access to funding for CPTD and IPET activities;
- d. Moving beyond the lecture room to provide on-the-ground support through school-based mentorship, thus ensuring that practicing teachers have pedagogical and professional support when they need it most.

One can add to the list above. For example, the quality of teachers in South Africa, and perhaps elsewhere, to a large extent, depends on:

- a. Quality of training programmes to which they have been exposed;
- b. Periodic review of curricular offerings in teacher training institutions;
- c. Provision of adequate facilities to equip prospective and in-service teachers with knowledge and skills for curriculum implementation;
- d. Supervision of teachers based on formative and guidance-oriented principles, rather than as summative or punitive measures;
- e. A good relationship between training institutions and professional bodies;
- f. Support by stakeholders such as school administration, school board, parents and teachers association, policy makers, etc.

All the above points, in one way or another, do impact on the quality of teachers working within an education system. But whatever resources are made available to support beginning or practicing teachers, each teacher must have the needed space for reflective practice. Good teaching is neither accidental nor a *déjà vu* experience; it is a deliberate endeavour which attempts to identify the problem at stake, reframe the problem and enact an effective strategy to solve it. Effective

instructional practice ultimately involves the mobilization of internal and external resources on the part of the teacher to effect a meaningful behaviour change in the learner. But even at that instance, both the teacher and learner do learn what works or does not work in a given situation and what to or not to do in the future if confronted with the same or similar contexts. According to Russell and Martin (2007), reflective practice is a more effective learning approach than simply relying on a default instructional repertoire. In this regard, Russell and Martin have identified a number of helpful issues relating to: narrowing the gap between theory and practice; whether or not reflection can be taught; whether or not learners are able to identify the major goal(s) for a teaching activity; whether or not a teacher can identify his/her own default teaching style; and whether or not a teacher is aware of the importance of coherence in teaching. They have also suggested the following questions with respect to reflective practice:

- How do you as a teacher react when asked to ‘reflect’?
- Do you have enough classroom experience to reflect about? Would it help if someone undertook to teach you how to reflect?
- What specific meanings do you associate with the words ‘reflect’ and ‘reflection’?
- Do you see reflection as something that can be taught? Is it possible to reflect during teaching as well as after?
- What major values do you hold for your teaching that will require you, as a teacher, to act in ways that differ from the norms of teacher behaviour?
- Do you find it helpful to think of your own teaching behaviours in terms of default styles (i.e. do-it-without-thinking) and deliberate efforts to modifying them to enact teaching moves that will enhance the quality of student learning?
- How coherent are the many messages conveyed by teacher educators to learning to teach a subject matter? (Russell and Martin 2007).

A detailed treatment of the questions above would certainly require a larger space than is available in this chapter. Nevertheless, it is worth stating that teacher education is a multifaceted subject that impinges various aspects of society and its survival mechanisms. It is not an overstatement that no society is greater than the calibre of its teachers.

Moving Beyond the Rhetoric of Transformation

South Africa, as a new democracy, has certainly made a giant leap in various sectors of the economy, no less the education system. It has transformed the former variegated and segregationist form of education to a single Ministry of Education or recently two Ministries of Education, namely Basic and Higher

Education. The new arrangement is to pay a closer attention to basic education as the minimum form of education a learner must have before leaving school. The ultimate aim is to make basic education free and compulsory for all learners. At the same time, government is aware of the importance of higher education in terms of knowledge production and skill development. As indicated earlier, the dearth of teachers in certain key areas such as mathematics, science, technology, language and commercial subjects has been a major concern. Hence, government bursaries and loans have been made available for students to pursue higher education in these areas. The ideal would have been to enact a system of free education for all children, especially children of the previously disadvantaged communities under the apartheid system of government, as a way to redress the inequality of the past.

To produce high quality teachers for the education system in South Africa and perhaps elsewhere, the questions above and similar ones cannot be ignored. But moving beyond the rhetoric of education reforms, the issue of preparing a cadre of teachers who are able to fulfil the aspirations and mandates of the new South Africa is not negotiable. It certainly warrants a closer consideration by teacher training institutions and other stakeholders. It is a well known fact that the quality of teachers at basic education level, to a large extent, is determined by the quality of training they received at higher education institutions.

The new curriculum in South Africa certainly demands new instructional strategies that go beyond the chalk-and-talk approach within which most teachers have been groomed. The new outcomes-based education policy underpinning that curriculum envisions teachers who are not only knowledgeable in their subjects but who are also able to function effectively in a holistic, learner-centered, well-integrated, activity-based and multicultural classroom. The new curriculum aims at developing the full potential of each learner to become a productive member of a democratic society. The challenge of achieving this aim, of course, rests heavily on teachers. As purveyors of societal values, teachers in South Africa as elsewhere have the unique role in building a society where oppression of people on account of gender, religious beliefs, colour of skin or other socio-cultural differences would never again be allowed. The curriculum envisages teachers who are capable 'mediators of learning, interpreters and designers of learning programmes and materials, leaders, administrators and managers, scholars, researchers and lifelong learners, community builders, citizens and pastors, assessors and learning area or phase specialists' (DOE 2002:3). The list might seem a tall order but, in reality, it depicts the complexity of the teaching-learning process of which the teacher is a key player. In other words, teaching goes far beyond the transmission or affirmation of well-worn clichés and rhetoric; it is a transaction between people seeking to share mutually some knowledge, experiences and values of critical importance.

The kind of teacher envisaged by the new curriculum is certainly different from most teachers entering into or already in the teaching profession. Nevertheless, the curriculum construes teaching as a complex and multifaceted activity. Whatever training a teacher might have, it is the school context, the teacher's understanding of that context and the belief he/she holds about teaching, learning and education as a whole that will ultimately shape his/her instructional practice. Unless teachers have a functional understanding of what teaching and learning entail and the socio-cultural context in which such endeavours are embedded, they might fail to move beyond the performance act of knowledge dissemination.

Conclusion

In the fifteen years of independence, the South African education system has undergone tremendous transformation. In terms of initial teacher education and training, a single ministry was created out of a fragmented and segregated education system. A single unified national qualifications framework was established to bring logic and coherence to the plethora of courses and qualifications prevalent during the apartheid years. In terms of teacher education, entry points for initial teacher education were delineated, provision was made to upgrade and up-skill those teachers whose training fell far short of the new qualification standards (see DOE 2000). A new unified Curriculum 2005 was introduced into the school system, providing a common pathway in primary and secondary education provision.

However, these changes, though urgent and necessary, overhauled an already entrenched system of segregation and racism when they were introduced. The deep fundamental changes resulted in a lot of stress and strains on the whole system which affected education quality, and teacher supply and demand. The teacher training institutions are challenged to respond to the increasing demands for new teachers, and also for upgrading and re-skilling teachers existing in the field, in order to meet the growing needs of an increasingly stressed education system.

Educational transformation has resulted in the need to attract new teachers to the profession and, above all, it also requires teacher training institutions to refocus their efforts to, not only provide IPET services, but also CPTD and school-based support services (see Delannov 2008) to enable teachers to cope with demands of teaching a highly innovative school curriculum in a democratic society.

Other challenges faced by the education system include the need to improve the quality of the teaching force, bearing in mind the negative effects that low teacher morale and commitment has on the said quality. Teacher quality issues have been linked to increasing the capacity of teachers to deliver educational programmes. In turn, teacher capacity is linked to various forms of teacher knowledge. It is suggested that if teacher education programmes are to provide improved service, they need to step out of the box and look at teacher education with lenses that include contextual factors such as multicultural classrooms and social justice.

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7

The Delivery System in Teacher Education

Kayode Ajayi and Adeyinka Adeniji

Introduction

Teacher education occupies a strategic place in most African countries' National Policy on Education. For example, Section 9 of the Nigerian National Policy on Education document highlights the importance of teacher education as the basis for other forms of education. This is because, just as no nation can rise above the quality of its educational system, 'no education system can also rise above the quality of its teachers'.

The purposes of Teacher Education, as highlighted in the National Policy on Education (2004), are:

- a. to produce highly motivated, conscientious and efficient classroom teachers for all levels of our education system;
- b. to encourage further the spirit of enquiry and creativity in teachers;
- c. to help teachers to fit into the social life of the community and society at large and to enhance their commitment to national objectives;
- d. to provide teachers with the intellectual and professional background adequate for their assignment and to make them adaptable to any changing situation, not only in the life of their country but also in the wider world;
- e. to enhance teachers' commitment to the teaching profession.

It is desirable that all teachers in Nigeria's educational institutions, from pre-primary to university levels, are professionally trained. Teacher education is currently being structured to equip teachers with a relevant and appropriate delivery system for the effective performance of their duties. The following institutions are expected to give the required professional training to teachers:

- i. Colleges of Education;

- ii. Faculties/Institutes of Education;
- iii. The National Teachers' Institute;
- iv. Teachers Centres.

Since teaching, like other professions, is now legally and publicly recognized as a profession, especially with the establishment of the Teachers' Registration Council of Nigeria (TRCN), all teachers are expected to be trained in the 'art' and 'science' of teaching. Towards achieving this goal, this chapter is designed to have a look at modern trends in teacher education delivery system, with a view to producing a new crop of teachers that are not only competent and knowledgeable in their subject-matter, but are also capable of holding their heads above water, especially in this age of technology and globalization.

Practical Issues in the Delivery System

It is instructive to note at the onset that the delivery system is closely associated with the teaching-learning process which is quite fundamental in teacher education. According to Oyedeji (1998), some questions are germane to the concept of teaching. These questions are: What is teaching? What makes an effective teacher? Are there certain identifiable skills that make one teacher more effective than another? Answers to all these questions will certainly provide direction for discussion on delivery system in teacher education.

Defining Teaching

Teaching can be defined as the action of a person cultivating skills, imparting knowledge or giving instruction to someone else. It can also be defined as the job of a person who teaches. Teaching may be defined as an attempt to bring about desirable changes in human learning, abilities and behaviours. Teaching intends to influence the learners to acquire behaviours that contribute to better living (Olaitan and Agusiobo 1982). Similarly, Dalen and Brittel (1959) define teaching as the guidance of pupils through planned activities so that they may acquire the richest learning possible from their experiences. They also add that learning is as a result of experiencing and requests the active participation of the learner.

Teaching, simply put, is that art of helping others to learn effectively. The word 'effectively' is crucial in the sense that pupils can learn with or without a teacher. But a teacher, through the use of appropriate strategies and techniques to facilitate learning, can improve the quality and quantity of learning to a level that can justify the term 'effective learning' (Obanya 1985).

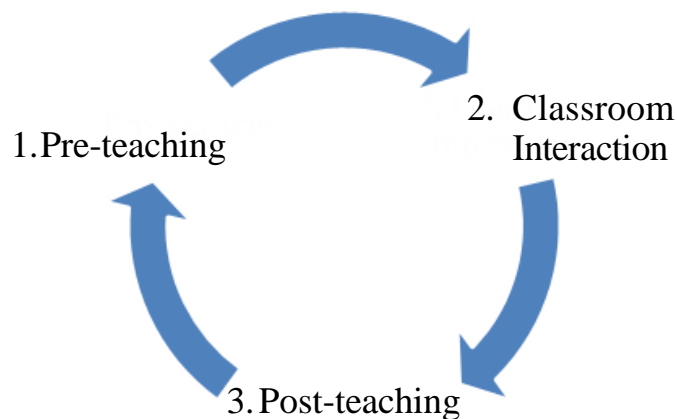
Another way one can look at the word 'teaching' is that there is no single activity which in itself constitutes teaching. Instead, teaching consists of a number of inter-related activities. These activities can be seen in the multiple roles of the teacher in the classroom.

The Teaching Process

According to Oyedeji (1998), teaching is a challenge that requires long hours of work and preparation. It is a continuous, cyclic process involving three main phases, as can be seen from Figure 7.1, viz:

- i. Pre-teaching – during which the teacher plans what to teach and prepares (and/or collects) the materials to be used for teaching;
 - ii. Classroom interaction – during which there should be purposeful interaction between the materials, the subject-matter, the learner and the teacher; and
 - iii. Post-teaching – during which the teacher reflects on the task just completed and feeds back his observation into the planning of the next lesson. This process continues *ad infinitum*.
- (1) Pre-teaching;
 - (2) Classroom Interaction;
 - (3) Post-teaching.

Figure 7.1: The Cyclic Nature of Teaching



Source: Adapted from Oyedeji (1998) Teaching for Innovation

Teaching Outcomes and Teaching Effectiveness

Every teaching is carried out for a purpose which is mainly to produce learning in the students in order to produce an educated person. However, it should be noted here that not every teaching brings about learning (Oyedeji 1998). There is therefore the need to look at the relationship between teaching and education.

At the end of a study commissioned by UNESCO on education and productive work in Africa, attempts were made to provide answers to the question of what education really is. Old school teachers' major objective of inculcating the three Rs (Reading, 'Riting, 'Rithmetic) were replaced with that of cultivating the three Hs, namely:

- i. the HEAD, or the faculties for thinking and reasoning in their highest forms;
- ii. the HEART, or the faculties for the development of feeling, emotions, values, attitudes and psycho-social adjustment to life situations; and
- iii. the HANDS, or the faculties for the neuro-physical coordination, physical agility and physical culture (Obanya 1980). Education, which teaching is set to promote, should therefore aim at the harmonious all-round development of an individual, by adequately cultivating the three Hs.

According to Obanya (1982), two main differences exist between the three Rs and the three Hs. First, the three Rs emphasize 'inculcation', i.e. providing the stimulation for the various desirable traits of the individuals to develop to their fullest capacity. Second, the three Rs deal with specific subject-matter, while the three Hs transcend the teaching and learning of specific subject-matter to everything that is done to nurture the individual learner. Teaching is seen as that conglomeration of complex but scientifically guided activities which aim at producing educated persons by cultivating their three Hs. Any approach or strategy which does not reflect any of the Hs will not produce educated persons and so will not amount to teaching. So, for any teacher to be effective, there are conditions his/her teaching must meet.

The essence of being an effective teacher lies in knowing what to do to foster pupils' learning and being able to do it. Effective teaching is primarily concerned with setting up a learning activity for each pupil, which is successful in bringing about the type of learning the teacher intends (Oyedeji 1998). The art of successful teaching is crucially bound up with developing both decision-making skills and action skills. Developing teaching skills is as much about developing and extending the type of decisions one makes about one's teaching as it is about the successful execution of those decisions.

There are some basic types of knowledge about the teaching profession that an effective teacher must possess. This knowledge base, according to Oyedeji (1998), includes:

- Knowledge about content;
- Knowledge about broad principles and strategies of classroom management and organization;
- Knowledge about curriculum materials and programmes;

- Knowledge about the teaching of particular content topics;
- Knowledge about pupils;
- Knowledge about educational contexts, ranging from the classroom group to the aspects of the community;
- Knowledge about educational aims and values.

The awareness of this basic knowledge of teaching by the teachers will equip them and make them perform effectively the various roles of an effective teacher.

Theoretical Explanation of the Delivery System in Teacher Education

Teacher education programme is usually structured to equip pre-service teachers with skills for effective performance of their duties. Thus, developing and inculcating these skills is highly desirable in teacher education.

Teaching Skills

Teaching skills can be defined as discrete and coherent activities by teachers which foster student learning. According to Calderhead (1986), it is useful to define teaching skills in terms of a number of features:

- i. They are intended to achieve a particular goal;
- ii. They take account of the particular context;
- iii. They require precision and fine-tuning;
- iv. They are performed smoothly;
- v. They are acquired through training practice.

In the words of Adesina (1985), skills and skill development deal with bringing up the child to acquire ability and practical knowledge in various forms of learning activities. Such skills can be developed in the pupils during teaching-learning activities. Teaching skills refer to specific teacher behaviour (such as lecturing, questioning, and discussing), using instructional aids designed to help the classroom instruction become more effective. The teaching skill approach is based on the assumption that the complex teaching act can be broken down into more easily trained skills and that the teacher can gradually acquire a repertoire that allows him or her to become flexible and versatile, since he or she has more teaching techniques at his or her command (UNICEF/UNESCO Innovation in Education Programme 1988).

Teaching skill can further be defined as a set of teacher behaviours which are specifically effective in bringing about desired changes in pupils.

In the light of this consideration, three important elements of teaching skills are discernable:

- i. *Knowledge*: comprising the teachers' knowledge about the subject, students' curriculum, teaching methods, the influence on teaching and learning of other factors and knowledge about one's own teaching skills;
- ii. *Decision-making*: comprising the thinking and decision-making which occurs before, during and after a lesson, concerning how best to achieve the educational outcomes intended;
- iii. *Evaluation*: comprising the various activities of the teacher to assess the effectiveness of the teaching (Oyedepi 1998).

Importance of Teaching Skills

Teaching skills are very important to both teachers and learners in many ways. For example, teaching skills enable the teacher to choose appropriate objectives for the lesson. An appropriate skill enables the learner to understand and digest easily the concept being taught by the teacher. Since skills involve the breakdown of complex teaching act into more easily taught concepts, an appropriate skill therefore makes teaching and learning more effective. It removes monotony from teaching and learning because variety of skills can be applied in the course of a lesson; thus making a lesson more lively and interesting.

Appropriate teaching skills enable the teacher to choose appropriate teaching aids for the lesson, thereby encouraging pupils' understanding of the lesson. It encourages a pupil-centred lesson rather than the chalk-and-talk method, and helps in eliminating boredom on the part of the pupils. Teachers who have knowledge of adequate and appropriate teaching skills become more resourceful, versatile and flexible in their approach to teaching. The teacher is then able to influence and control pupils' behaviour and better manage his class.

Types of Skills and their Application in Teaching

Teaching skills that can be applied to many subjects at different levels have been identified, isolated, collected and classified from a range of sources. Research studies, classroom interactions, analysis, observation of classrooms and various theories of teaching have helped in identifying these skills. The Austrian Advisory Committee on Research and Development in Education has analyzed teaching into 140 skills (Ajayi 1995).

Allen and Ryan of Stanford University (1984) have suggested 14 skills which are representatives of general teaching skills:

1. Writing instructional objective;
2. Stimulus variation;
3. Skills in questioning;
4. Skills in explaining;

5. Skills in using blackboard;
6. Initiating a lesson;
7. Skills in communication;
8. Lecturing;
9. Silence and non-verbal cues;
10. Closure;
11. Fluency in asking questions;
12. Planned repetition;
13. Illustrations and use of examples;
14. Recognizing attending behaviour (Sampath et al 1984).

Here, it is necessary to discuss some of the skills which are deemed crucial for effective teaching in the classroom.

Skills in Writing Lesson Objectives

Skills in writing objectives are given priority here because many teachers take their faulting steps from here. Once the objective of the lesson is wrongly written or chosen, that is the beginning of a lousy lesson. The objective can mar or bring the beauty in a lesson out. Some skills in writing an objective or choosing an appropriate objective include the following:

- a. An objective must be precise;
- b. It must be derived from the subject matter;
- c. It must be achievable within a given period;
- d. The age and mental ability of the learner must be considered in choosing an objective;
- e. The classroom and general environment of the pupils must be considered also;
- f. Pupils' previous experiences have a role to play in choosing an objective;

Once the teacher takes pains in following the ideas above, he would not have serious problems in achieving the objective for the lesson (Mc Farland 1973).

Skills of Stimulus Variation

Boredom is often a major problem in the classroom, but many teachers in their teaching styles ignore this problem. Many teachers remain glued to their sitting or standing position while teaching the pupils. Worse still, they talk in a monotonous voice throughout the lesson.

Stimulus variation is geared towards using various attention-compelling behaviours to maintain pupils' attention. These behaviours include:

- a. *Movement*: A teacher's movement from one section of the class to another facilitates useful shifts for attention. The movement must be purposeful. Such movement can be towards the chalkboard to illustrate a point or it can be going round to mark pupils' work.
- b. *Gesture*: This involves movement of the head, hands and body for more expressive and dynamic presentation. The teacher can use his hand to explain shapes, sizes, etc. The head can be used by the teacher to register agreement or disagreement to pupil's answer.
- c. *Changes in Speech Pattern*: The teacher can effectively sustain pupils' attention by sudden or radical change in tone, volume or speed of the teacher's speech, modulation of voice and so on.
- d. *Focusing*: This involves verbal gestures or verbal-gestured focusing, calling attention to specific materials as 'listen to this', 'look at this', etc.
- e. *Change in Interaction Styles*: Instead of teacher monologue, the teacher is encouraged to use three patterns of interaction, viz: Teacher-Group (Teacher making a dialogue with the entire class); Teacher-Student (A student is asked probing questions by the teacher); Student-Student (One student's response is re-addressed to another student for comment on clarification).
- f. *Pausing*: Short deliberate intervals of silence can be used while conveying information, lecturing or explaining.

Skill of Questioning

Asking questions constitutes a major part of teachers' activities. Meredith D. Gall (1970) reports that about sixty per cent of teachers' questions require students to recall facts; about twenty per cent require students to think and the remaining 20 per cent require procedural responses usually associated with classroom management. The essence of emphasizing skill of questioning is to encourage teachers to avoid questions requiring recall of facts and to concentrate instead on asking questions that will encourage thinking and analysis. For the practice of this skill, questions are categorized into low-order-questions, middle-order-questions and high-order-questions. Low-order questions are those asking for knowledge; middle-order-questions are those asking for comprehension or application, while high-order-questions are those asking for analysis, synthesis or evaluation. For simplicity, teachers should try as much as possible to use more of high-order questions and minimize the use of low-order questions.

When a teacher asks pupils a question and the correct answer is not given, the teacher should not punish the pupils; rather, he should lead the pupils to the correct answers by asking probing questions which will eventually lead them to the correct answer. The skill of probing questions comprises the following:

- a. *Prompting*: Questions where there is a hint for the pupils to help them in reaching the expected response.
- b. *Seeking Further Information*: Questions where more information is sought, asking how and why of correct or wrong part of the partially-correct answer.
- c. *Refocusing Question*: Question which makes the pupils compare a phenomenon with another phenomenon for similarity or contrast or for any other relationship.
- d. *Redirected Question*: Questions which are directed to more than one pupil for response.

Skill of Explaining

Explanation is a set of inter-related statements made by the teacher. Teachers, in their teaching, make use of explanation most of the time. Explanation is necessary in order to increase pupils' understanding of the lesson. To be able to explain well, the teacher has to develop certain desirable behaviours like using beginning and concluding statements lacking in continuity; and vocabulary, lacking in fluency and using vague words and phrases. The teacher should try as much as possible to be patient when explaining concepts or ideas to the pupils. Pupils should be allowed to ask questions during or after the period of explanation.

Skill of Using the Chalkboard

The chalkboard is one of the most widely-used visual aids. Many teachers usually forget the availability of a versatile tool close at hand. The components of the skill of using the chalkboard are:

- a. Teachers should make sure that their writing on the board is legible. The writing on the board should be with letters bold enough for pupils at the back of the class to read. There should be space in-between letters and words;
- b. The chalkboard must be neat at all times. This can be achieved by retaining only the relevant matter under focus and by seeing that there is no over-writing;
- c. Appropriateness of written work, in respect of meaning, brevity, simplicity and continuity in the points being presented, underlining important words using coloured chalk, developing the necessary and proportionate diagrams along with the lesson.

Skill of Reinforcement

Pupils need approval of their behaviour. Pupils' participation in the class increases when they are appreciated by the teacher for answering questions correctly. This is the result of positive reinforcement. On the other hand, negative reinforcement

results in pupils being passive if they happen to be discouraged by the teacher's behaviour. Positive and negative reinforcement are either verbal or non-verbal and have the following components:

- a. Using verbal reinforcers;
- b. Repeating and re-phrasing pupils' answers;
- c. Writing pupils' answers on the chalkboard;
- d. Using extra verbal cues like "um" and "aha" to encourage pupils while answering.

These are positive reinforcers. A teacher should avoid using negative verbal and non-verbal reinforcers so that the pupils are encouraged to participate to the maximum. Duthie (1980) gives more examples of positive reinforcers such as: teacher praises; teacher uses pupils' contribution; teacher relates pupils' contribution; teacher writes pupils' contribution on the board. These are reinforcers that can increase pupils' participation in the lesson.

Specific Teaching Skills

Joyce and Weil (1980) suggest that there are many kinds of effective teachers. They further suggest that different teachers are effective under different circumstances. For example, a teacher might be quite effective at the elementary level but quite ineffective at the secondary level or vice versa. Elementary teachers tend to be required to teach all areas of the curriculum, whereas secondary teachers usually teach in only one or two curriculum areas. Thus, different specific skills are required to be able to teach effectively at either the elementary or secondary level.

Major development differences between elementary and secondary level students help differentiate the skills needed by teachers at different grade levels. At the secondary level, adolescents are going through puberty, accompanied by all the physical body changes and emotional adjustments. Thus, students at this level need teachers who can help them acquire complex physical, social, emotional and cognitive skills. In contrast, pupils at the elementary level are still quite dependent and need teachers who can display and provide affection and act as surrogate parents. As a result of these developmental differences, vastly different skills are needed to work effectively with elementary level pupils and secondary level students.

Generic Teaching Skills

There are also certain teaching skills that are essential for effective teaching in all grades and in all curriculum areas. These generic skills can be classified as pre-instructional, instructional or post-instructional (Moore 1992).

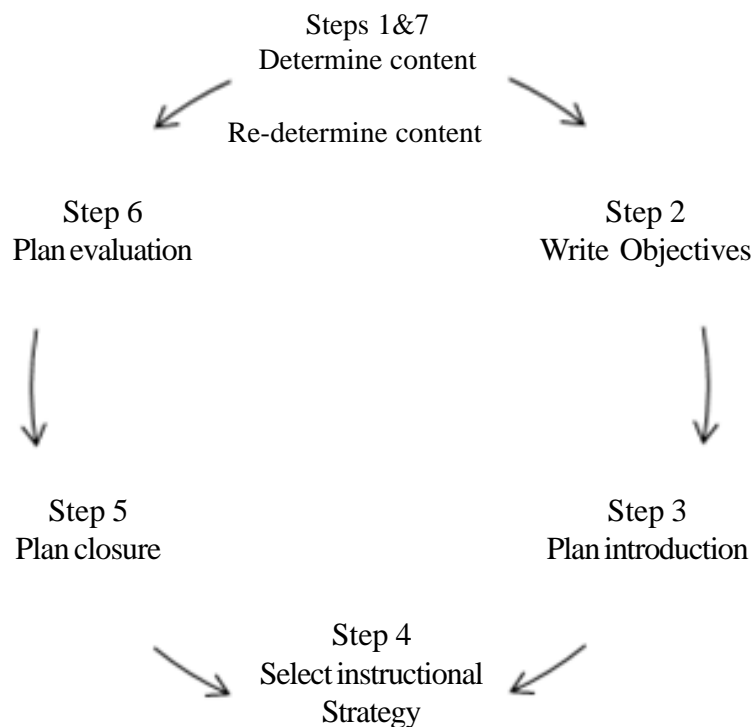
Pre-Instructional Skills: The key to effective teaching is planning. The teacher must plan well to teach well. Oyedeki (1998) identifies and discusses briefly the

skills one needs to plan well. According to him, answers must be provided sequentially to the following questions:

1. What content should be taught?
2. What are the desired learner outcomes?
3. What teaching materials will be needed?
4. What is the best way to introduce the subject?
5. What is the best instructional strategy for the intended learning?
6. How should the lesson be closed?
7. How should the students be evaluated?

This sequential planning process is illustrated in Figure 7.2. Step 1 involves identifying the content; Step 2, writing objectives; Step 3, introducing the lesson; Step 4, selecting an instructional strategy; Step 5, closing the lesson; Step 6, evaluating the lesson; and Step 7, identifying new content to be taught.

Figure 7.2: Basic Seven-Step Planning Process



Source: Adapted from Oyedeji (1998) Teaching for Innovation

The planning process, as presented in Figure 7.2, represents a major undertaking that is essential to effective teaching.

A thorough examination of and reflection on the pre-instructional and planning process reveals that it is a major undertaking that requires a number of skills. Specifically, a teacher must be able to:

1. Make accurate observations;
2. Write objectives;
3. Select appropriate closure;
4. Plan appropriate cognitive sets (sets induction);
5. Select appropriate teaching strategies;
6. Determine and develop appropriate evaluations. Whether a student-teacher (future teacher) or an experienced one, one needs to develop and refine these pre-instructional skills. The results will be more effective planning and increased student learning (Oyededeji 1998).

Instructional Skills

Once a lesson is planned, it has to be implemented. Implementing a lesson in order to ensure that maximum learning takes place is another difficult and tedious task that requires special skills essential to all teachers.

One of the most central tasks of instruction is the ability of the teacher to communicate effectively with the students. One cannot communicate effectively without gaining students' attention and arousing and maintaining their interest. This requires skill in the use of stimulus variation, questions and reinforcement.

Management of the learning environment is also a skill that all effective teachers must master. The teacher must be able to get students' cooperation, arouse and maintain their interest and involvement in learning tasks, and conduct the business of the classroom smoothly and efficiently.

Successful implementation of a well-planned lesson requires a number of special skills. Specifically, a teacher must be able to:

1. Establish cognitive sets (set induction);
2. Communicate;
3. Use stimulus variation;
4. Use reinforcement effectively;
5. Use questioning techniques;
6. Manage a classroom;
7. Establish lesson closure;
8. Evaluate objectives (Oyededeji 1998).

Although, the development and refinement of these instructional skills does not guarantee success, according to Moore (1992), they should greatly increase teachers' potential for success.

Post-Instructional Skills

Teaching involves well-planned and organized evaluation. Evaluation information needs to be collected and analyzed with respect to teachers' objectives, and judgements must be made regarding the level of student achievement. The two skills here include:

1. Ability to analyse evaluative information, and
2. Ability to make judgements regarding evaluative information.

The development and refinement of pre-instructional, instructional and post-instructional teaching skills is important to all professional educators. Without these, teachers can never maximize their teaching effectiveness.

Skills in Classroom Management

Classroom management, most of the time, is taken for granted by many experienced teachers, whereas it is necessary for effective teaching and learning processes. Classroom management often takes a big proportion of the teacher's time because it involves a lot of activities. Such activities include keeping school records, reports, requisition for equipment and supplies or the necessary routine of classroom control and discipline. Improper classroom management can lead to disorder and other disciplinary problems in the classroom. Consequently, effective classroom learning can be jeopardized. Poor classroom management can also lead to an indifferent or negative attitude on the part of the pupils. The following are required for effective classroom management:

- a. The teacher should give pupils sufficient activity to keep them busy;
- b. Noise in the classroom should be at a reasonable level. Pupils should not be left idle or alone; otherwise the class will become very noisy. Argument among pupils must be discouraged as this can lead to fighting;
- c. The teacher's authority is necessary as it is through authority that the teacher can control and discipline the pupils;
- d. Honesty is important on the teacher's part since pupils do watch and judge a teacher's behaviour. If a teacher is honest, pupils will surely emulate him;
- e. Firmness by the teacher will go a long way to foster discipline in the class (Farrant 1976).

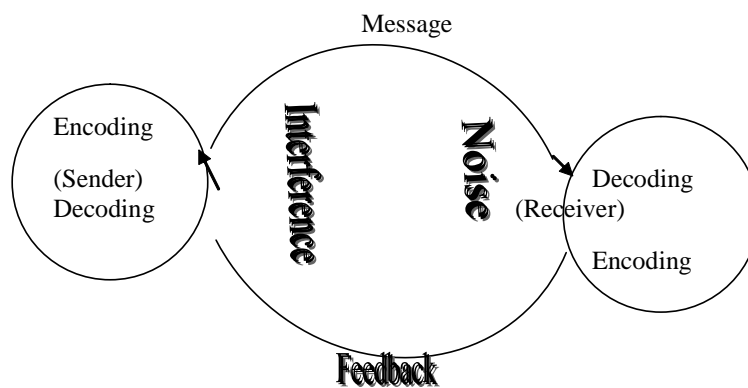
Communication and Instruction in the Classroom

Furthermore, since teachers are by design, orientation and accreditation professionals in the dissemination of knowledge, it is necessary to discuss the major attributes of communication and instruction which form the core of teacher education. Teacher education programmes enriched with communication and instruction, serve a dual purpose. First, they should increase the efficiency and effectiveness of the instructional and educational process in the programme. Secondly, and more crucial, a programme for educating teachers should itself be a model for teaching, embodying the most effective and innovative procedures and concepts of communication technology (UNESCO 1974:224).

Without communication, teaching and learning cannot occur. Of course, Omoniyi (2005) describes communication as a *sine-qua non* to effective teaching and learning. At the heart of the relationship between teacher and students is the teacher's ability to communicate. Effective communication skills are not only the prerequisite for successful work in the classroom; they also contribute to making the classroom environment lively and enjoyable to students (Oyedeji 1998).

Teaching has been described as a communications process with the teacher as the 'sender' and the student the 'receiver'. Teachers continually send messages to students and receive messages from them. This is illustrated in Figure 7.3 below.

Figure 7.3: The Communication Process



Source: Adapted from Teaching for Innovation (Oyedeji 1998)

The sender first encodes (composes) a message into a form which will be understood by the receiver and then transmits this message. The transmitted message is received and decoded by a receiver, who then encodes some form of reaction to the message. The reaction is often non-verbal and is used to communicate whether the message was understood or not. The receiver sends

the encoded reaction back to the sender, who then decodes and reacts to the feedback. The sender's reaction to the feedback may be to continue with new information, to clarify the original message or to repeat.

Messages may be sent or received through verbal, physical or situational stimuli. Teachers must be skilled at sending and receiving messages through all these modes. Improving the quality and delivery of teaching is a system-wide problem in Africa's educational institutions. Impactful research requires appropriate infrastructure and communication facilities. These communication facilities are generally referred to as 'educational media'.

Educational media are generally defined as the devices available to teachers for use in aiding teaching and learning in a more efficient and stimulating manner than the use of only the teacher's voice. According to Omoniyi (2005), they are the media born of the communication revolution which can be used for instructional purposes alongside the teacher. The media are technologies that are capable of delivering information and experiences widely and quickly. They serve very different specific aims: explanation, illustration, systematic instruction, preservation, practice, etc. The general argument in favour of using educational media in schools is that they promote efficiency and bring about innovation because they help students get away from the traditional rote-memory learning. Omoniyi (2005) in Hoban (1991) reported that when effectively used, the media can achieve the following:

- i. Supply concrete basis for conceptual thinking and reduce meaningless word responses of pupils;
- ii. Make learning more permanent. Learners are able to retain and recall information with ease;
- iii. Offer a reality of experience which stimulates self-activity on the part of learners;
- iv. Provide high degree of interest for learners;
- v. Develop continuity of thought, especially motion pictures;
- vi. Contribute to growths of meaning and, through that, enhance vocabulary development;
- vii. Provide experiences not easily obtained through other materials, thus contributing to the efficiency, depth and variety of learning.

Cybernetics

Cybernetics is the science of communications and automatic control systems in both machines and living things. The term itself originated from a Greek work *kubernotos-steerman* in 1947, to describe a concept that invokes the rich interaction of goals, predictions (objectives), actions (process), feedback and response in

communication systems of all kinds (Wiener 1948). Early applications in the control of physical systems were not limited to communication. It included the designing of electronic circuits and manoeuvring of robots. Principles of cybernetics are applicable in the design of software and hardware or social, managerial and other interpersonal systems.

Cybernetics, in this age of information and communication technology (ICT), is the study of computer control systems and the relationship between these artificial systems and biological systems, i.e. man-machine relationship. Cybernetics is simply about the development of feedback-control mechanism in communication. ICTs have significantly improved the feedback control in communication. It is now possible to have synchronous communication in man-machine interactions.

Cyberspace and Virtual Events as Aids to the Delivery System

Virtual event or reality is a computer-generated environment that allows the user to experience various aspects of life through online transactions. Cyberspace, which is connected when one logs on to the online service, is the environment in which electronic communication or e-learning occurs, and it offers many possibilities in distance learning. The possibilities, which are available on the internet, include (1) online tutorials; (2) virtual library; (3) virtual classrooms, where classes are taught entirely on line, as against the online tutorial, which is individualistic; (4) correspondence courses, where instructional materials are sent to individual students and returned via the internet rather than by mail.

Virtual events offer great promise because of the capabilities of the world wide web (www) to support multiple media channels – text, graphics, audio and video, all in digital form. Initially, synchronous communication via the internet was limited to text-based applications, such as Internet Relay Chat (IRC) and Multi-User Domains (MUDs). With the advancement in the world wide web, it is possible to transmit information via audio and video in addition to text, images – both still and animated – and interactive features such as forms, questionnaires and bulletin board discussion (McLellan 1998).

Galbreath (1999) highlights 17 key computer technologies/applications that can help in imparting the skills required by teachers of this modern age. These are:

1. Computers/network computers;
2. E-mail;
3. Video production equipment;
4. Database software (e.g. Microsoft Access, Informix);
5. Internet/worldwide web;

6. Project management software (e.g. MS project);
7. Knowledge management (e.g. Inference);
8. Decision support software (e.g. Cognos);
9. Presentation software (e.g. PowerPoint);
10. Graphic software (e.g. Adobe Illustrator);
11. Data visualization (e.g. Visual insights);
12. Desktop publishing (e.g. Aldus PageMaker);
13. Word processing software (e.g. Word, Word Perfect);
14. Spreadsheet software (e.g. Excel);
15. Video conferencing (e.g. Picture Tel);
16. Group ware (e.g. Lotus notes);
17. Remote collaboration software (e.g. Net meeting).

The technologies enhance and develop essential skills of communication, problem solving, information access and management, collaboration and teaming, visual production, graphic production and advertisement, e-commerce and e-banking. Some of the modern-day teaching materials that can be used for effective delivery system in teacher education include the following:

- *Audio Media*: This refers to the teaching and learning devices that appeal to the sense of hearing only. They include audio recordings (tape and disc), broadcast radio and telephone.
- *Audio-Visuals*: These are instructional materials that appeal to the senses of hearing and sight simultaneously. They include television, video recording and sound film.
- *Educational Boards*: These are the boards that are used for teaching and learning purposes. They include chalkboard, flip board, white board, flannel board, bulletin board, etc.
- *Flash Cards*: These are small, compact cards which are flashed before a fairly large audience to explain an idea or convey information.
- *Format*: This refers to the style or arrangement of design elements or the surface on which designs are made.
- *Graphics*: These are the two-dimensional visuals used to facilitate communication. They include posters, graphs, charts, maps, etc.
- *Hardware*: These comprise machines or equipment used to access information stored in certain materials. They include projectors, computers, television receiver, tape/disc player, etc.

- *Models*: These are recognizable three-dimensional representation of real things, whether animate or inanimate. Models can be produced using clay, *papier mache*, plastine, cement, sawdust, etc. They could be very effective if students can see and examine the materials from various angles.
- *Non-projected Materials*: These are materials that need no projection or accessibility through hardware. Such include realia, maps, specimens, posters and charts.
- *Plasticine*: This refers to synthetic clay, a type of plastic substance used for modelling.
- *Projected Materials*: These are materials containing information which can be projected on screens through the aid of hardware. They include transparencies, slides and films.
- *Projectors*: These are equipment or machines for projecting software. They include slide, overhead, opaque and multimedia projectors.
- *Realia*: These are real things or objects. They include currency notes, artifacts and plants.
- *Software*: They are carriers of information which are relayed through the hardware. They include tapes, discs, transparencies, slides and films.
- *Specimens*: Specimens are small pieces, segments or samples of real objects or materials.
- *Still Pictures*: These are prints and motionless pictures. They include photographs, illustrations, cartoons and drawings from printed materials.
- *Texture*: This refers to the actual perceived roughness and smoothness of a surface.
- *Templates*: These are outlines of shapes cut out from some fairly thick materials such as cardboard, hardboard, plastic or metal sheet.
- *Three-dimensional Objects*: These are teaching and learning materials with length, breath and depth. They include models and real objects.
- *Two-dimensional Objects*: These are prints or flat educational materials done on formats with length and breadth only. They include photographs, charts, posters and cartoons.
- *Visuals*: These consist of materials that appeal to sight only, e.g. poster, drawings, model, specimen, charts and educational boards.

Audio Aids

These are teaching and learning devises that mostly appeal to the sense of hearing. They include records, instructional radio, audio recordings and telephone signals.

Instructional Radio

Radio audience receives electronic signals that are broadcast or transmitted through the air, over regular AM or FM radio frequencies. Broadcast radio can be adapted for educational use, especially where there is a shortage of competent, specialist teachers.

Audio Teleconference: This is simply an extension of telephone call. Advances in telephone now allow individuals or groups of people at different locations to hear and be heard clearly and easily. Audio teleconference is a two-way conversation which involves the use of the telephone (mobile or static) to connect people from different locations.

Visual Aids

These are teaching and learning devices that appeal to sense of sight only. They include pictures, charts, three-dimensional objects and models.

Charts: Consists mainly of symbols and lines. They are symbolic and abstract; hence, they need to be explained to students. Examples are line chart (graph), bar-chart, organizational chart, pie-chart, flow-chart, pictorial, life chart and flip chart. Good charts should be simple, with accurate content, and the lettering must be bold and conspicuous. Content should stand out against the background and appropriate colours should be used.

Print Media: These include books, magazines, journals, handouts and newspapers. They are readily accessible, useful for formal and non-formal education. They have wide audience and long range. As transmitters of ideas, they help to improve the skills of teachers.

Projectors and Projected Visuals

There are many types of projectors. They include overhead, opaque, slide, filmstrip and film projectors. Most of them are visual aids, as they can only project materials that appeal to sight. Their use depends on several inter-related factors such as size of class, level, physical environment, availability, cost and effectiveness.

Slide Projector: This is an example of diascopic projection equipment as it requires light to function. Most modern slide projectors are fitted with lamp as the source of light to enable them function effectively in semi-darkened room. The slide is a frame of picture bound by self-adhesive card mounts. They offer a wide coverage of subject matter. Suitable materials are available in the market for students of all levels: from primary to university level, particularly in science. Resourceful teachers can produce slides, specifically to illustrate their lessons, using ball-point pen to work on clear acetate sheet or tracing paper. One value of slide projector lies in the ease with which the teacher can operate the machine. This

makes it possible to switch the method of teaching from oral to visual illustration and back, so providing an invaluable mental change of activity on the part of the students.

The Overhead Projector: It is designed to project an image from a transparency placed on a horizontal stage (Fresnel lens) and project it upward into a lens-mirror combination and then over the operator's shoulder to a nearby screen. The projected pictures may be diagrams prepared on acetate roll or sheet. They could be drawn with scribe or liquid colour e.g. radiographic ink and miracle markers. Writing could also be done using chinagraph pencils, marlumo colour pencils or by applying lateral set. Apart from acetate sheets, old x-ray films from which silver emulsion has been removed are good for making transparencies. Any clear transparent material will serve the same purpose. All these colouring and writing materials can be cleaned off if no longer needed. Those containing colours dissolved in spirit are removed with methylated spirit or kerosene. Others containing water-based colour can be cleaned off with damp cloth.

The Opaque Projector: This projects images directly from printed materials in books, magazines, photographs, maps and other materials without any processing. It could also project small three-dimensional objects such as small tools, coins and specimens, colours and textures reproduced well on the machine. The projector can be used to enlarge small-scale pictures for class viewing during a lesson, or it can be used for drawing attention to certain aspects of a lesson from a book. Opaque projector is very effective in teaching subjects like science, social studies, languages and disciplines that require visual illustrations.

The Multi-Media Projector: This projector is a versatile digital projector which can project still and motion images. Many refer to it as computer projector. However, it must be noted that the projector does not only project images generated on the computer, it can also be used directly with a video player. A video player can be connected to the projector for the images recorded on video tape or disc to be displayed on the screen, particularly for a large class. Images that would have otherwise been projected with overhead, slide or opaque projector can also be generated on the computer and projected accordingly.

Audio-Visuals

The term refers to those instructional materials that appeal to the senses of hearing and sight simultaneously. The television and sound movies are examples.

Instructional Television

Undoubtedly, television has profoundly affected the way we present and process information. It is therefore expected that television, as a form of technology, should also have had a significant impact in the realm of education. There can be no argument that it exposes everyone to a great deal of information, much of

which is retained and absorbed. More importantly, television presents information in a highly dynamic and multimedia form. It relies on quickly changing images, drama, sound and music, comedy and various other devices not often found in traditional materials.

The Internet

The internet certainly has great potential for educational use and especially for the delivery system in teacher education. It is therefore necessary to know more about it. To have a good picture of the net, let us imagine a room filled with many spiders, each spinning its own web. The webs are so interconnected that the spiders can move freely within this maze. That is a simplified view of the internet – a collection of many different computers and computer networks globally, that are linked together. The internet enables a person to sit at his computer and exchange information with other computers and computer users in other parts of the world.

The World Wide Web (WWW)

The web is a part of the internet. It supports the storage and retrieval or playing of photographs, graphics, animations, videos and sounds. By using a web browser, one can easily and quickly view information and colourful graphics that may be stored in computer in many different countries. The ability to move nimbly back and forth from one web site to another is commonly called ‘surfing the net’.

Electronic Mail (E-mail)

Electronic mail is used to send individual or group messages. It functions like the conventional postal system, except that it is faster and more efficient. In learning, the e-mail functions as personal messaging in which learners and teachers can work one-on-one. It allows for individuality in learning. A learner can also exchange information with other learners. E-mail is an effective tool to facilitate learning activities by providing feedback from the teacher or other learners.

Compact Disc-Read Only Memory (CD-ROM)

The CD-ROM is characterized by a large storage capacity for video, audio, animation and interactive multimedia. CD-ROMs offer media formats, such as text, image, graphics, sound and animation. Learners can study the context only through their own computers, not through online environment. Therefore, a CD-ROM provides learners, particularly those learning at distance, an effective tool for the purpose of individual learning. Learners can also access courses at any time, at their own pace, without the necessity of an online connection.

Interactive Video

The system typically consists of a micro-computer and a video source (either videotape or videodisc) with the ability to present both computer text and video scenes within the same lesson. A computer interface connects each of these parts into a single presentation medium to be used by the student. Interactive video is widely used in the delivery of distance education. Discs are reported to have advantages over cassettes: freeze-frame, a rapid and accurate search, large single frame, storage capacity, slow and sped-up motion and lower machine cost.

Tele-Video Instruction

Telecommunication devices such as telephone (mobile or static) can also be combined with instructional video for distance learning. The telephone will allow for two-way communication between the facilitator and the distance learners at their different locations or study centres. Learners can also interact and exchange information using the telephone. The device allows for individualized instruction and self-study (Omoniyi 2005).

Conclusion

Delivery system in teacher education in Africa today, and most especially Nigeria, should not be seen as 'business as usual' with the use of traditional or orthodox methods of teaching which are at variance with contemporary trends and practices worldwide. There is the urgent need to take delivery system in teacher education, especially in this digital era, more seriously since it is the only way of achieving meaningful results in the present era of globalization.

It should always be borne in mind that, just as no nation can rise above the quality of its educational system, no educational system can equally rise above the quality of its teaching force. Hence, concerted efforts must always be made to ensure that the nation's teaching force, especially at the primary and secondary levels, is well equipped with modern methods of delivering knowledge such that the product of the classroom interaction can be better improved upon and the seemingly fallen standard of education and poor results being witnessed year in year out can become a thing of the past.

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8

The Delivery System in Teacher Education in Nigeria: Traditional Practices and New Paradigms

Simeon Dosunmu

Introduction

Education is accepted all over the world as a process of transmitting the cultural heritage, stabilizing the present and improving or changing the future. The school system, regardless of which level of operation, is generally accepted as a major agent of education that provides avenues for interaction between students and teachers on subject matters. Today, there seems to be grave social concern about the potential of the school system to deliver sound education to the children in Nigeria because the education system is crisis-ridden. Lassa (2000) laments that there is the crisis of values, crisis of social confidence, crisis of resource management, crisis of discipline, crisis of population explosion, crisis of educational orientation and social relevance as well as the crisis of the teaching profession becoming a dying and decadent industry particularly in Nigeria.

The role of the teacher in education cannot be over-emphasized because 'no education system can rise above the quality of its teachers' (FGN 2004). It is imperative, therefore, that teachers must master their subject-matter in order to impart knowledge successfully (Van den Berg 2002). Teacher education is considered as a process of developing skilled teaching manpower to enable them provide good quality and relevant education to learners at whatever level they operate within the education system.

In the colonial period, development was incidental or peripheral; the goal of economic policy was mainly exploitation of natural resources, and exportation

of raw materials or semi-finished products accompanied by the marketing of industrial goods manufactured in Britain. As a result, even pencils, erasers and geometry boxes for schools were imported. Naturally, an economy of this kind made no great demand on education in terms of manpower production. The demands on the quality of training were even more limited since no critical abilities and creative potentials were to be encouraged, lest the stability of the colonial system itself may be shaken by the educated. In fact, education was treated as an evil necessary for day-to-day working (Adesina 2004).

Similarly, Fafunwa (1974) states that education became text-bookish in its content; standing aloof from the realities of life and concentrating on the 'knowledge' of individual 'disciplines'. Physics or economics were taught according to worldwide abstract principles and laws, creating an impression of comprehensiveness of the subjects even though, through such an approach, they were devoid of social implications, utility and purpose. The role of the teacher was correspondingly to teach the assigned subject meticulously and thoroughly, and to 'examine' on the basis of students' ability to reproduce what they had been taught. The system tended to breed conformism and pedantic scholarship. That such a system practiced over centuries, and in so many countries, still produced great thinkers, scholars and scientists who have, in a sense, been the architects of our civilization as it is today, is a clear proof of the irrepressible nature of human creativity and of man's unceasing struggle to overcome ignorance, conquer nature and improve the quality of his life. The situation has, however, radically altered since the middle of the last century. Country after country has been freed from the clutches of imperialism. National initiatives have been unleashed to transform economies and societies. The very word 'development' has acquired a new meaning and dimension. Change, rather than status quo, is the order of the day and education has been recognized as the tool to bring it about. Great wealth of experience has been accumulated on the modalities by which education can play such a role. Perhaps it would not be wrong to say that in the process, the concept of education itself has been changed. It is no more confined to formal structures and institutions – it can reach out in a variety of ways and the human resources of the whole community could be used for the purpose (Adesina 2004).

Freeman and Johnson (2004) explain that the dynamics of knowledge have led to the concept of life-long learning for the individual. A great deal has been discovered about learning itself and its highly personal character. Three boundaries of the well-established disciplines of the past have crumbled and inter-disciplinary teaching and researches have come into existence.

According to the National Policy on Education (FGN 2004), the goals of teacher education shall be:

- a. producing highly motivated, conscientious and efficient classroom teachers for all levels of our education system;

- b. encouraging the spirit of enquiry and creativity in teachers;
- c. helping teachers fit into the social life of the community and the society at large, and enhancing their commitment to national goals;
- d. providing teachers with the intellectual and professional background adequate for their assignment and capable of making them adaptable to changing conditions; and
- e. enhancing teachers' commitment to the teaching profession.

It will not be wide off the mark at this juncture to trace the history of teacher education in Nigeria.

History of Teacher Education

The importance and the role of the teaching profession in any society flows out of what the society expects from education at a human level, what role it assigns to education in national development and what goals of development are pursued by the nation. These three levels are inter-related and they flow from the historic and socio-cultural situation as much as from the economic policy of the country. The quality of educational services and the learning outcomes of pupils or students are determined by a large number of factors, of which the role of the teacher is uppermost.

In the case of Nigeria, the attainment of independence was the result of a prolonged national struggle in the course of which the goals of development came to be quite well defined, the most important being the building up of a modern self-reliant economy, making optimum use of our own resources in men and materials (Aarons 2003). This is based on a clear realization that, in the world of today, the strength and relative independence of the economic base determines the scope, even of political freedom. The other and equally important goal of national development can be said to be the enhancement of production accompanied by the distribution of goods and services with a view to ameliorating poverty, creating conditions of social justice and thus strengthening the foundations of a socialist and democratic state. The goals of national development translated in human terms imply the cultivation of a personality with knowledge and awareness, not only in the special fields but also of culture, tradition and the needs of the peoples; a personality endowed with values which would promote socialism, national integration, secularism and scientific temper together with enthusiasm to change society through personal commitment and involvement. In other words, our concept of national development goes far beyond economic growth: the concern for creating a cohesive and vibrant nation out of people speaking different languages, professing different religions, possessing a variety of cultures is equally great. In this sphere, education has to be the mainstay of our endeavour.

Obanya (2002) asserts that students would learn on their own through resources and situations provided for the purpose and they would develop an enquiring mind, discover knowledge and arrive at attitudes and outlooks according to their own light. Many of them would go far beyond the teacher in their scope and competence; hence, the teacher would really become not one who knows and tells but a facilitator of learning, perhaps a co-discoverer of knowledge through common experience with the student. Improvement in quality would also require the full utilization of educational technology which, in turn, needs a tremendous effort to train academics and produce 'software' suitable for our purposes. Thus, raising the quality of education in the context of our social and economic aspirations acquires a very different meaning from what prevailed in the pre-independence period.

Mkpa (2002) states that, 'at the secondary and post-secondary levels, there were about eight different qualifications that could earn one a teaching job'. These included Ordinary National Diploma, Nigeria Certificate in Education, Higher National Diploma, Bachelor's Degree (without teacher education), and Postgraduate Diploma in Education, Bachelor of Education, Master of Education and Doctorate Degree. Until recently, teaching was not professionalized. It was an all-comer field. The teacher education curriculum was geared toward primary school teacher education only. That was the practice in existence between 1896 and 1970. The type of teachers needed in Nigeria has become clearly defined in the National Policy on Education Implementation Committee blueprint. It was prescribed that the types and qualifications of teachers required should be as follows:

- a. *Pre-primary Education*: Grade II Teacher with NCE teachers as heads;
- b. *Primary Education*: NCE teachers with graduate teachers as heads;
- c. *Junior Secondary Schools*: NCE and university graduates;
- d. *Senior Secondary Schools*: NCE and university graduates with professional qualifications;
- e. *Technical Colleges, Polytechnics and Colleges of Education*: University graduates with post-graduate qualifications in their disciplines together with professional qualifications, practical industrial exposure and experience;
- f. *University*: University graduates with postgraduate qualifications together with professional qualifications and experience.

This prescription implies that the minimum qualification to teach in our primary school in Nigeria is NCE and the government has taken steps to ensure its implementation. All the existing Grade II 'teachers' colleges are being phased out and serving Grade II teachers are being re-trained to obtain NCE before the deadline to disengage them.

It is obvious that the new dimensions of education which make it an integral part of the national developmental enterprise puts great responsibility on the main vehicle of education, namely the teacher. Teachers not only implement an education programme by commensurate methods but they are also its originator. It is teachers who interact with students of different ages and frames of thought to ensure that wide-ranging educational objectives are achieved without reducing education to either brainwashing or propaganda. As intellectuals, teachers are social critics but with a special sense of responsibility to lead in a constructive direction. They are also their own teachers since they continually work at the frontiers of knowledge and often face problems and situations which are unprecedented, and where past experience is of limited value. As agents of change, they too have to be flexible and ready to change.

In the sphere of the traditional work of the teacher, namely teaching and research, the perspectives have radically changed during the last few decades. When knowledge was expanding at a relatively slow pace and the purpose of classroom teaching was also largely to maintain social status quo, courses and prescribed books were not in a state of flux, teachers could also get by for years on the basis of notes they prepared, which were often dictated to students since they had to reproduce the ideas in order to pass examinations. Now, with the explosion of knowledge and the need to base teaching on facts and figures related to our own society, curricula have often to be completely recast and the exercise has to be repeated every few years. Consequently, in order to remain up-to-date, teachers have to be on their toes, learning on a continuous basis.

Imperative of New Paradigms

The role of the teacher in engaging students in learning is immensely complex in that it concerns almost all academic and social aspects of the classroom environment. Teaching practices have also to change since what is intended is not superficial learning but deep understanding of phenomena, ideas or problems so that knowledge can be applied to concrete situations in order to change the reality. Students should not be treated as passive receptacles of knowledge; they must be encouraged to be curious and explorative, critical and innovative. Furthermore, since the cognitive domain alone cannot be singled out as the objective of teaching, the affective domain of attitudes, character, values, and social and developmental concerns have to be taken into account. Thus the teaching, however well prepared and good it may be, can no more suffice. Psychologists have given enough insight into the processes through which learning is accomplished, and one knows that a number of devices such as field work projects, seminars, stimulatory exercises, problem-solving sessions, tutorials and term papers, etc., are available to achieve different objectives of teaching. New audio-visual aids are more versatile and effective than the one-time shades,

transparencies and films are available and will be increasingly common in the years to come. Teachers have, therefore, to equip themselves with new tools of their trade, to utilize interactive methods of instruction.

In connection with the use of films, video cassettes and video discs, and because of the lowered prices accompanied by greater sophistication of computers, there is also the opportunity to produce software in all subjects, at all levels and in a variety of modes. Since television radio and the social media are already taking up the broadcast of some educational programmes, this also provides an opportunity to teachers to use their creative ability in the interest of distance education which would greatly enhance the reach as well as the scope of higher education. Programmes of continuing education for the public at large, as also of professionals including teachers themselves, give additional dimensions to the activity of teachers which is directly related to national manpower development.

The cooperative feature is all the more important because skill and field or practical-oriented training which is often a part of such courses, can best be done through other institutions and agencies whose cooperation has to be sought. Teachers alone can negotiate with concerned experts and agencies to get these programmes going. In fact, when teachers will take the initiative in establishing educational programmes with the involvement of government agencies and departments, public sector industry and voluntary organizations, only then will highly relevant programme be evolved and put on the ground, improving employability of the students graduating from the system.

Linkage with socioeconomic activity is also necessary for conducting studies and research in highly pertinent subjects. For example, the department of agriculture may be taking special measures for the distribution of seed or fertilizer, or making cold storage facilities available. Students and scholars in our educational institutions could easily study the impact of these programmes in the given sociocultural matrix – impacts on productivity, rural development, family resources, nutrition, schooling, readiness for social change, and so on. Many times, scientific and technological problems will be identified through such linkage, enabling a research programme to be mounted. This collaboration will open up a mine of ideas, some of which may lead to improvement in productivity and performance, and others to growth of knowledge, which has long-term fall-out in the form of new applications. Teachers in higher education, through such relevant research, would not only improve their professional performance, help scholars to be in great demand for employment, but they would also help to solve numerous social, cultural and economic problems. Basic research, in any case, is the strong point of university teachers.

Many of these activities would call for new styles of work and modes of management, needing changes in institutional procedures and even in their

governance. This has to be approached with an open mind since no existing structures and functions are immutable or sacrosanct. If the educational institutions are to become well-knit into the fabric of productive activity in our society, the very concept of autonomy will undergo a definite change. A 'systems approach' will replace the ivory tower approach.

There are many things which need to be done now, which were not visualized in the colonial period, or even otherwise in the processes of the development of some advanced countries of the world. But it is clear that whether one talks of high quality of education or of new methods of instruction, restructuring of courses or linkages with economic activities, the great tasks in the building of student character and temperament or of high quality research connected with development needs and related problems of management of education, it is the teacher who plays the crucial role. Teachers are instruments of educational change as much as education is an instrument of social change and national development. If teachers are not inspired, but frustrated, if they are not given the encouragement to perform their role and are in fact, neglected or deprived even of the basic necessities, then they cannot be expected to be committed to a human or a professional role which is appropriate to current needs. In fact, in the negative sense, harried and frustrated teachers may become overly conscious of their personal or group needs and oblivious to the needs and call of the society around. Such teachers may not only shun their duties, but may do many other things to miseducate the young people, thereby multiplying the problems of the society. The National Commission on Teachers in Higher Education would therefore make a fervent plea, on the one hand, to the Government to appreciate how potent teachers are in engineering social change and hence to provide them status, encouragement and resources for the purpose; and on the other, to the teachers to open their minds and hearts to the new possibilities, and to discharge their responsibilities with an urgent sense of social purpose. Grant (1990: 23) notes:

...from a multicultural perspective, all students should receive an education that continuously affirms human diversity – one that embraces the history and culture of *all* racial groups and that teaches people to take charge of their own destinies.... With regard to teaching, a multicultural perspective assumes that teachers will hold high expectations for all students and that they will challenge those students who are trapped in the cycle of poverty and despair to rise above it.

In addition, teachers should:

- simplify the language of instruction, not just the concept being taught;
- work toward depth, not breadth of information, presenting materials in a clear, concise, comprehensible manner and eliminating all peripheral, non-essential information;

- impart information through oral, visual, auditory, and kinaesthetic learning modalities;
- use graphic organizers, such as webs, Venn diagrams and charts, to make information more accessible to second-language learners. Content materials present text which is too dense for second-language learners;
- present content area vocabulary and concepts using regalia, picture files, and hands-on activities; and,
- examine students' backgrounds and learn how their past experiences will effect and affect learning. The impact of students' backgrounds on learning will depend on their previous schooling, home languages and cultures, and the concepts important to those cultures (Ponsessa 1996).

Given the above explanation, it can also be explained that, as a result of the growing graduate unemployment in Nigeria, there is a need to give entrepreneurial training to all our graduating students. The teachers should not be excluded; they should first be educated in this direction for them to transfer the knowledge to the students. This implies that future teacher education must include some entrepreneurial skill development courses that must be taken by all. The teachers should not only be trained in the act of self-development through continuous learning, they should also be adequately prepared for self-employment. Moreover, owing to the various economic reforms of government in Nigeria, there have been some cutbacks in social sector expenditure including those on education. Hence, there are gaps between resource requirement and resource allocation to institutions. The implication of this is that teachers must develop the capability to improve. Future teachers must be developed to possess these capabilities.

In sum, it is imperative that these five challenges in teaching and learning with technology be tackled adequately in the training of teachers, by:

1. creating learning environments that promote active learning, critical thinking, collaborative learning, and knowledge creation;
2. developing twenty first century literacy (information, digital, and visual) among students;
3. reaching and engaging today's learners;
4. encouraging adoption and innovation in teaching and learning with IT; and,
5. advancing innovation in teaching and learning with technology in an era of inadequate resources.

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9

Sociological Perspectives of Skills Development in Teacher Education

Adesoji Oni and Titilayo Soji-Oni

Introduction

Education institutions are the principal vehicles for the transmission of what societies consider as worthwhile knowledge. Arguably, in secular societies, they are also major institutions for the promotion of what societies consider to be worthwhile values. That is why sociology, by definition, is concerned with the study of human behaviour in groups or sub-systems of the social systems, the functions that each of the groups serve in society, the inter-relationship of the sub-systems and how changes in one sub-system affect other sub-systems and the behaviour of their members. Thus, sociology studies human societies and their structure and dynamics. This is fundamentally concerned with social institutions and, as such, is ideally placed to research education. Social institutions which are the basic social structures and machinery through which human society organizes, directs and executes its activities more or less adapt to the functions they are expected to execute for the society.

Sociology therefore, applied to education, takes as its object the education-society relationship and attempts to explain one by the other. That it is concerned with the ways in which educational institutions and patterns of human behaviour affect the nature of education and educational outcomes. As such, research in the field has addressed wide-ranging issues, including the workings of educational institutions, the role of education in society, curriculum content (both formal and 'hidden'), patterns of access and outcome, and classroom interaction. It is perhaps due to this diversity and the rich theoretical perspectives that sociology of education was developed. The foregoing shows that sociologists believe that education is concerned with the way social relationships in the school are ordered and organized

to shape the personality of the individual. That is why a good educational system, in all its full substance and ramifications, is related to the level of culture, industrial development, rate of urbanization, political organization, religious climate, family structures, stratification and other institutions of the total social systems. Since education has to fulfil the individual's and society's needs, both in the present and the future, the educational system must maintain pace with other sub-systems. It was as a result of this, for example, that African countries recognized the pivotal role of education as the fountainhead of national development. That is why the Nigerian National Policy on Education (FRN 2004) in particular, provides Nigeria's philosophy of education, based on the belief that:

- Education is an instrument for national development;
- Education fosters the worth and development of the individual for the development of the society;
- There is the need for functional education for the promotion of a progressive united Nigeria; to this end, school programmes need to be relevant.

The policy further (on page 8), reiterates the importance of education to national development that:

Education shall continue to be highly rated in the national development plans because education is the most important instrument of change; any fundamental change in the intellectual and social outlook of any society has to be preceded by educational revolution.

Therefore in Nigeria, as in other African countries, there is the consciousness or belief in the tremendous importance of education as the catalyst for national development.

Education is the business of teachers and thus, if education occupies a central role in national development, then teacher education is at the epicentre of national development. Again, in most African countries, the national policies on education do not lose sight of this. They posit that no education system can rise above the quality of its teachers; and that is why, all over the world, much prominence is given to teacher education because of the peculiar role of teachers in national development. Buttressing this view, Kalusi (2000) submits that the quality of any education system depends on the availability and competence of the teaching corps. Thus, the teacher factor in any educational programme is regarded as most crucial because what teachers know can make a world of difference and what they do not know can be an irreparable loss to the development of the abilities and potentialities of the society's younger generation.

One could see from the ongoing discussion that teachers are the hubs of any educational system. They are the determinants of the quality of education. Therefore, no matter how grandiose, innovative and imaginative the plans and programmes are, the desired objectives may not be achieved without the right number of adequately educated and trained, dedicated and loyal, motivated and disciplined, committed and happy teachers, serving at all levels of the educational system. Thus, teacher education which is at the centre of preparing teachers towards enhancing educational development, equipping and educating teachers to effectively perform their roles, involves the promotion of the right attitudes, values, behaviours and methods, which would enable them to be capable of transmitting the right information effectively to learners in this digital age. It can therefore be explained that, while more is demanded of teacher educators in the digital age, obsolescence seems to glamour the existing practice. In other words, the transition of the world from one of separate units into a global-digital integrated whole requires a new vision of the teacher's role and pedagogical preparation. The question of what knowledge, attitudes, behaviours and skills teachers should possess is the subject of our discussion in this chapter.

Goals of Teacher Education

Teacher education is an aspect of formal education that deals with the systematic training, planned preparation and professional development of eligible and willing students for teaching positions, especially in the pre-primary, primary and secondary levels of education (Onah 2005). It is also that component of any educational system charged with the education and training of teachers to acquire the competences and skills of teaching for improvement in the quality of teachers for the school system (Afe 1995). It is often properly planned and systematically tailored and applied for the cultivation of those who teach or will teach, particularly but not exclusively, in primary and post-primary schools (Okafor 1988).

Teacher education therefore refers to the policies and procedures designed to equip teachers with the knowledge, attitudes, behaviours and skills they require to perform their tasks effectively in the school and classroom. The question that may be asked is: Can the objectives of teacher education be achieved if teacher education is not geared towards producing teachers who are globalization or digital-friendly? As earlier pointed out, to achieve these goals, teachers are the main determinant of the quality in education. If they are apathetic, uncommitted, uninspired, lazy, unmotivated, immoral, anti-social and, most especially, uninformed, the whole nation is doomed. If they are ignorant in their disciplines and thereby impart wrong information, they are not only useless but also dangerous. In other words, there is the need for teacher education to be reviewed, taking cognizance of the demanding competition posed by the digital world.

Sociological Perspectives of Teachers' Role

According to Bamisaiye (1999), two schools of thought are relevant in discussing the social roles of teachers. One school holds that teachers are political weapons of oppression in a social institution which is designed to impress social inequalities as a natural arrangement among young learners in their formative years. Sociologically, teachers perform this role of maintaining a reproductive function in the society, since the school is an agent of cultural transmission. A second theory is the production theory, which holds that teachers are agents of social and cultural transformation. Both theories put the teacher educator in a conflict situation because they make paradoxical demands on him, both as a professional and as a member of the society.

From the structural functionalist perspectives, Carlson (1987) sees the teacher as part of a skilled labour force which helps to maintain capitalist appropriation of profit by preparing learners for unequal social stratification. The social stratification is seen as a mechanism which ensures that the most talented and able members of the society are allocated to those positions which are functionally most important to the society. This view presents the teacher in a conflict situation because it presupposes that curricular practices in the school are imposed on the teachers and therefore on learners by the *status quo* and not a product of consensus among the different segments of the society that have a stake in education. The teacher's conflict role is further aggravated by the fact that he or she is also on the receiving end of coercion by the *status quo*. Like their learners,

They have been (therefore) bureaucratically subordinated, rigidly boxed in by a predetermined curriculum and held account-able for attaining instructional 'productivity' goals (Carlson 1987: 290).

Education has therefore become a major growth industry; and when anything becomes a commodity, the classical demand and supply theory does come into the picture. The same has happened with education in the contemporary era. Since education is a priced commodity, its consumers are those who can pay for it. The teacher is therefore seen as another agent of production for satisfying capitalist profit-making goals. This view of the teacher presents him as an object or factor of production rather than an autonomous individual or a member of a group performing a worthwhile social role. Bamisaiye (1999), summarizes the view of this theory of teaching and the teacher's role:

If all that they (teachers) are doing is directly reproducing pupils as units to be slotted into the labour market, their job seems hardly worth doing (Carlson 1987:292).

Would the teacher educator work with this concept of the teacher, he would be producing uncritical apprentices; and if education has any significant impact on the society, as Carlson believes it has, the society would sooner than later retrogress rather than progress, for change and innovation are parts of social wellbeing.

The second theory which is called the 'productive theory' sees the teacher as an apostle of social change, particularly of human intellect and conscience. We have many teachers like this in the history of educational thought and practice. These are Socrates, Plato and Jean Jacques Rousseau (father of the French Revolution). Productive teachers are not only thinkers; they stimulate learners to think. They know and can equip learners to build up knowledge for themselves. They are not only technical experts, they are morally committed to social good, and therefore, the goal of their teaching is not only to equip for measurable outcomes of learning, but the immeasurable outcomes of personality and social improvement. It is such teachers that can be committed for both mental and moral autonomy with regard to preparing African citizens for the digital era.

But again, this teacher is in a conflict situation. For one, intellectual and moral autonomy is attained by successive but successful resolution of conflict both in learning and in the application of learning. Such teachers are usually in conflict with the status quo because they would not be able to accommodate coercion and oppression but would question, rather than uphold inequalities and injustice.

The question, therefore, is how can the teacher of the digital age be a self-directing professional who knows the substance of what to teach, the reason for teaching it and how to teach it to awaken in the learners the attainment of intellectual and moral autonomy for social good? Do teachers have the contemporary relevant skills that they need to be able to analyze, synthesize and evaluate data and situations to immediately improve low student performance? As Carlson (1987) quotes from the Carnegie Forum Report:

Teachers must think for themselves if they are to help others think for themselves, be able to act independently and collaborate with others and render critical judgment.... Only by critically reflecting on their own roles in the schooling process, theorizing about what could be, and working to promote specific changes consistent with a broad vision of a just society, can teachers expand and realize their capacity to challenge the *status quo* in ways that are transformative rather than merely reformist (Carlson 1987:307).

It is only this teacher who can wield any political influence and make meaningful contribution to change society. As practitioners in a social process that directly influences the lives of most citizens and indirectly that of everybody, teachers have to be educated to care not only about themselves but also about the welfare of everyone else. What then are the required skills that will make teachers relevant in these social processes in the digital age?

Teacher Education and the Challenge of Skills Development in the Digital Era

We have argued above that the quality of teacher education has been identified as a pillar of quality education and that any national policy, reforms and implementation of any education system is pivoted by the quality of teachers and teacher education of that system. It is the products of teachers and education that handle every economy of any nation. Models and frames of teachers' professional development, school management board, education for all and even the millennium development goals revolve round the frames of teacher education.

Most African nations' policies on education, with their emphasis on science, technical, vocational education and self-reliance, were aimed at satisfying the philosophical, economic, sociological and psychological needs of the citizens. The wealth of a society, according to Bagudo (2002) determines, to a large extent, the development of the society; and for individuals and teacher educators in particular to meet up with the demands of their society, they need some skills.

To survive in the digital age, all Africans, particularly the teachers that produce the work force of the continent, need some basic survival skills, which include the ability to reason, the ability to readjust one's own terms to cultural flux and the ability to control and utilize one's uniqueness while participating harmoniously in the society. Africans therefore need the mastery of specific and identifiable skills in order to participate effectively and bargain boldly at world summits and conferences. Without appreciable skills in science and technology, agriculture and specific economic sectors, a country is poor and powerless, has no voice and may continue to look unto other nations for survival. Consequently, most African nations have adopted education as an instrument for achieving development, as education is seen as the most important change agent in the intellectual and social outlook of any society. To this end, the teacher is a builder of a nation, responsible for training the minds of the young ones in the society. It is believed therefore that a functional teacher education in Africa, like any other developing continent, can help its citizens explore the networking of our global village. This is achievable through systematic mobilization of Africa's resources, through a modernized cadre of scientific and technological manpower.

Africa is currently described paradoxically as a continent experiencing downward decay – from developing to under-developing – and rated as among the poorest regions of the world, despite her abundant human and material resources. In reality, the continent has all it takes to be a great continent. Thus, Africa's system of teacher education, especially, should be able to make prospective engineers and technicians' creative and innovative, and who will change our disadvantaged position in the digital age. After all, the West and Japan used their own background resources and environments through liberalizing education to reach their present enviable levels of development.

To make teacher education more relevant in this digital age, it must equip our teachers at all levels to be capable of self-study. This will make them not only consumers of information but also creators, originators and inventors. The belief is that the more we are able to reflect on prescribed goals, the more we are not likely to be exploited and manipulated economically, socially and even culturally. Teacher education at this level serves as a link between the unpredictable world in which man lives and the tools to cope with the numerous challenges created by globalization.

In addition, teacher education has a vital role of protecting local studies and local cultures that are inevitably threatened by mega culture in the digital age. Through self-knowledge, they (teachers) will be able to evaluate and assess critically what to teach and how to teach it. It has also been observed that education has become globalized. No nation is an island. Through technology, the world has come together. Nations are inter-connected with ease. Education is now international or inter-cultural. The teacher now stands as the midwife between the new digital age and the people. So, for teachers to deliver the expected global or digital baby in any given society, they must be equipped effectively to do so.

We could also observe the political democratization process sweeping through the world, which has resulted in both economic and educational change, and which has posed a tremendous challenge to teacher education, particularly in the developing world. It is now accepted that education, particularly for the developing countries of the world, is not just the prerequisite but also the prime determinant of economic and technological development as well as political stability and national survival. It is also known that if education unlocks the door to modernization, it is the teachers who sharpen our intellectual and technical abilities to build the foundations and pillars of this modernization. Therefore, it is a nationally suicidal for any developing nation, in this digital era, to have its best brains design and build its roads and bridges, cure its sick, formulate and interpret its laws, while its poorest brains teach its youth. The results, as we are witnessing in parts of Africa, are roads that wash away after the first rains, bridges that collapse after few years of use, taps without water, electricity that is most erratic, telephones that are perpetually out of order, hospitals that kill as much as they cure, incongruous laws, purchased and tele-guided justice. Clearly, these results are not true of all African nations but their elements exist in several African countries and other underdeveloped nations.

Indeed, we cannot have effective environment engineers without good teachers. We cannot have efficient, dedicated and humane doctors without effective, dedicated, responsible and humane teachers. We cannot have incorruptible judges without upright and dependable teachers. We cannot even have a strong, effective, efficient and loyal army to defend and protect our territorial integrity without

loyal and patriotic teachers. Given this scenario, teacher education curriculum in the digital era should be revised and enriched with appropriate and current ICT training skills, capable of enabling teachers knowledgeable enough to teach relevant ideas that will make their students skillful, productive and equipped to cater for the needs of the society.

Similarly, it can be argued that of all advances in the digital age, information and communication technology has had the most serious impact on how we see the world and how we live in it. It has permeated virtually all aspects of human endeavour. Thus, according to Ojo (2006), we now have e-governance, e-library, e-education, etc. ICT is revolutionizing the world of scholarship. In the developed world, for instance, you cannot access books in the library without being computer literate; you become seriously impaired if you are not computer compliant. The term 'literate', according to Ojo (2006), is assuming a new meaning in the context of information and communication technology. A literate person, it should be noted, is a person who can demonstrate some knowledge and competence. This used to be the ability to 'read and write', but it has long been replaced by a more demanding requirement. It is in this context that it can be explained that any individual who cannot use the computer at the basic level – for instance, to browse and check mail or to browse for relevant information – is a twenty-first century illiterate. Thus, teacher educators in the digital age need to be digitally empowered. This implies the abilities of teachers to be trained in the use of information technology and the internet to improve their life skills and strengthen their capabilities in the information society. This empowerment can happen when teachers improve their skills and knowledge, learn to share information, create new and diverse information flows, and increase their interaction and ways of participation in information highways. Teachers are digitally empowered when they have in-depth awareness, competence, utilization and knowledge to participate in computer operating systems, internet, mailing lists, web logs, online publishing systems, WikiWikiWeb–techniques or common www-publishing formats, digital cameras, cell-phones, digital television and interactive audios, among others.

With digital empowerment, teacher educators in this jet age will gain new abilities and ways to participate and express themselves in a networked information technology-driven society (Webster 2000; Norris 2001). Being digitally empowered or skillful is likely to influence a teacher's future pathways since it is generally considered an essential requirement for access to the desirable labour market (Legris, Ingham and Collette 2003). In addition, it is a stepping stone for lifelong learning (Blair 2002; Ikediugwu 2008). Not only does digital empowerment or skill affect the ability of teacher educators to compete in the labour market; it also affects the types of knowledge they impart, the status they attain and the wages they receive. Without digital skill empowerment for teachers, Africa would remain very short of future personnel who can manage modern competitive enterprises and run sophisticated technologies.

Conclusion

It has been argued in this chapter that the destiny of a nation is shaped in its classrooms and it is the teachers who are the very important instruments in moulding that destiny. To be able to discharge such a big responsibility in this digital age, it is very important and necessary that teachers must become conscious of their role in the society. Their behaviour indicates their efforts at doing their job properly. Their personality must reflect characteristics of good citizenship. Teachers themselves must be exposed to the concepts of freedom, equality, dignity of the individual, rights and duties, etc., so that they may transmit the same to the younger generation.

It is also important to note that, in considering what might comprise the pedagogy of teacher education, it seems wise to encourage self-study as a meaningful way for uncovering important facets of the knowledge of practice. In so doing, teacher educators might then begin to capture, unpack and portray the complexities of teaching and learning about teaching in ways that might lead to deeper understandings of practice. Importantly, and as well noted by others (e.g., Clandinnin 1995; Korthagen et al. 2001; Russell and Korthagen 1995), the learning of teaching about teaching needs to extend beyond personal knowledge construction in order that shared knowledge of teacher education practices might begin to be articulated and developed.

Korthagen and Lunenberg (2004) describe what they see as important gains in teacher education through connections to self-study: personal, institutional and collective. They note that personal gains include the professional development of individual teacher educators, institutional gains are clear in relation to re-shaping teacher education curricula and programmes, and collective gains are evident in growing professional (international) community of teacher educators, which benefits from the ongoing interaction and sharing of insights. Overall, they conclude that 'self-study research contributes to a process of growing professionalism and empowerment of the teacher educator community as a whole' (p. 446). This collective gain certainly accords with what Cochran-Smith and Lytle (2004) recognized as important when they noted that self-study can be 'a way to re-invent teacher education by continuously interrogating one's own practice and all of its underlying assumptions' (p. 607).

The challenge of self-study is for teacher educators to look into their practice with new eyes so that their understanding of teaching and learning about teaching become more meaningful and applicable in practice. The promise of self-study is that, through such endeavours, the articulation of a pedagogy of teacher education might emerge and be both meaningful and applicable in the practice of others in the teacher education professional community.

Evidence in Knowledge as a Skill

Man is an intelligent being and is therefore, a problem solver. This means that, in behaviour and verbal expression, man is able to solve problems in order to make living easier for himself and others. He sometimes creates a problem in order to solve another or get in the process of doing so. An innocent healthy baby, for example, is immunized against a deadly disease by being inoculated with the germs of that disease, thereby making the child sick for a short while. What Louis Pasteur accidentally found out with chickens is today used world-wide to save lives before modern living is threatened by preventable diseases of various types (Bamisaiye 1998:34).

In this digital age, therefore, teachers need to be conscious at all times that their learners are basically intelligent, and so, are able to learn new ideas and put them into practice. Not only that, teachers' main professional responsibility is not only to encounter their learners as intelligent beings. They are expected to use available educational strategies at their disposal to further develop the learners' intelligence. This development is expected to be for learning at the theoretical level and facilitate the application of theory to practical living. In order to succeed in these levels of professional practice, teachers do not only need to assume their learners as actual or potential thinkers; they also need to complement this assumption with practical educational tools or resources. This also has quality implications. Resources then have to be relevant to the human and cognitive development of the learner.

Evidence in Morality, Technology as a Skill

While educators need to be concerned with the content of knowledge to be taught, educational technology becomes significant because it is most relevant to ensure effective learning in the school. The process of education becomes morally significant in this context because how a learner is made to learn can make a learning experience educative or miseducating. If my tool (*tekhne*) of ensuring that my pre-school children learn poetry is to threaten them with a wild dog standing nearby or subject them to some other fearful experience, my attempt at educating them in poetry would be morally questionable. Whatever teachers choose to teach learners, it is educationally imperative that they operate on the assumption that the tool is only a means in the education of the learner. The learner is the end.

The interplay of human and material resources on human intellect in an educational environment is therefore expected to be intellectually developed in teachers for them to master the particular level of heritage of learning their areas of specialization. But more importantly, teacher educators are expected to be critical thinkers, inventors and improvisers of material resources around them to foster learning.

Teacher educators are expected to develop a moral value system, i.e. principles of life which they hold sufficiently dear to them as to live by them (Hill 1989:78). Only when teachers live by these values can they also stimulate the development of such values in learners. Education is in the final analysis, a moral value word. Students are also expected to develop a positive attitude to life and, more especially, to their professions because they can only attain life fulfilment when they are favourably disposed to their professions.

A positive attitude to the profession is also important for teaching to be seen as a life mission. Where students come to education because they cannot be employed otherwise or they are waiting for other employment to come through, commitment, dedication and a sense of mission are lacking. A favourable attitude cannot be developed and therefore students of such teachers become victims of miseducation rather than beneficiaries of education.

Because our learners are also teachers, the use of material resources in the process of educating them should make the learner receptive to knowledge. On the other hand, our teachers are expected to be innovative, i.e. find new ways of teaching a well-known idea, critical, be stimulated to find alternative teaching strategies and stimulate their learners to be critical. They should also be adaptive, i.e. be able to use a material resource for many learning purposes, and effectively so.

One can therefore conclude that a teacher educator should use *tekhne*, i.e. technology, to enhance the skills of learning in students. This is important for the latter to be effective, receptive thinkers who could be entrusted with the heritage of learning, which is available in our educational institutions. But more importantly, *tekhne* should be used to stimulate critical thinking in our student-teachers. This is because a critical mind is innovative and creative. This quality dimension is essential to bring about dynamism and change, which are so vital to education and to human life generally.

Teacher education programmes should therefore stress the development of classroom management skills before and during pre-service teachers' field experiences. Research on interpersonal communication, as related to the role of the teacher and the teaching situation, has identified a need for increased effectiveness in facilitative interpersonal functioning and classroom dynamics. These traits can be taught to pre-service teachers. Components of a comprehensive classroom management curriculum for pre-service teacher education should concentrate on strengthening communication skills, building good teacher-pupil relationships, and facilitating responsible behaviour. Methods for dealing with aspects of management during student teaching are handled cooperatively between student-teachers and the university supervisor.

For teacher education to be fruitful and productive in the digital age, it should include creativity, dynamism, open-mindedness and the qualities of interactive, reliable and responsible human beings with faith in their heart, based on their

moral commitments (without impositions from outside), emotional stability, and interest in others as well as concern for their affairs. With the declining role of the traditional teacher in teaching the acquisition of subject matter and facts, the education of teachers must stress the concepts and skills of leadership and management.

We have also realized that skill development in teacher education in the digital era is really complex and challenging. However, understanding them is important so that education can be adjusted according to the needs of the society. It is not therefore a matter of saying that the digital age is good or bad for the society. What really matters is that digital age has affected society as a whole and it is not different with education. Education in the digital age has to be different from what it has been for many decades. Thus, the curricula, pedagogy, practices and goals have to be re-structured, considering the necessity of preparing the students to live in these complex and diverse societies. As was previously discussed, schools have an important role in making the students develop some new skills – intercultural, communication, digital – so that they will be able to act in societies in a critical way, understanding and respecting the differences as something important and necessary. Having such a global consciousness is crucial to making them functional in this digital era.

Designers of teacher education courses therefore have to re-consider the aims and structures of the courses because they are responsible for preparing the future teachers who are going to teach students these new skills. The courses should be organized to prepare the future teachers to understand these new globalized societies and their role in the education of the children so as to teach them how to behave in these complex and diverse societies. These future teachers have to be conscious of the knowledge that should be taught. They have to be conscious of their role in citizenship education. The students also need to learn the social, cognitive and cultural relevance of the digital era, so that they can understand their role in the new modernity. Besides this, to understand this digital era, it is important to establish a collaborative and interdisciplinary discussion, which Suarez-Orozco and Sattin (2007) call 'global cooperation'. Teachers from different places can discuss the solutions for a determined situation that can be useful for other groups. These exchanges are opportunities for the people to learn other possibilities to analyze and deal with similar problems and get engaged in productive social change.

With more technology, definitely the digital age will bring more leisure to individuals and institutions. Teacher education should also, as a matter of necessity, pay more attention to the concept of time and how to manage it. Time allocated for reflection and for programmes for recreation is basic to any further progress and meaningful life. Progress in medical sciences, for example, has enabled man to improve life expectancy and prolong lifespan. Genetic engineering promises great accomplishments.

African teachers of the digital era should, as a matter of necessity, be self-directing professionals who know the substance of what to teach, the reason for teaching it and how to teach it to awaken in the learners the attainment of intellectual and moral development for social good. It is only such a teacher who can wield some political influence and make meaningful contribution to change society. As practitioners in a social process that directly influences the lives of most citizens, and indirectly that of everybody, teachers have to be educated to care not only about themselves but also about the welfare of the learners in totality.

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10

Counselling Perspective for Skills Development in Teacher Education

Afolasade A. Sulaiman

Introduction

Education is the greatest force that can be used to bring about change. It is the greatest investment that a nation can make for the quick development of its economic, political, sociological and human resources (Ijaiya 2008). Generally, education helps to shape the children of today into adults of tomorrow. In realization of this, the Nigerian policy makers emphasized all-round development of the child. The development of his affective, cognitive and psychomotor domain is stressed. Specifically, the fifth objective of the Universal Basic Education (UBE) states thus: ‘ensuring the acquisition of appropriate level of literacy, numeracy, manipulative, communicative and life skills as well as ethical, moral and civic values needed for laying a solid foundation for the life-long learning’ (Federal Ministry of Education 2004).

Unfortunately, in practice, educators, teachers and parents are more concerned about the cognitive domain, that is, the mental aspect of development, which includes perception, sensation, imagination, memory and thinking. Sulaiman (2007) notes a wide gap between the policy of education and the practice in Lagos State primary schools, especially the private schools. While the National Policy on Education (2004) emphasizes learning through play for pre-primary schools, serious academic work is what was on ground in the schools. Instead of a five-year-old child being in pre-primary school, according to the policy, at age five, a child is already in Primary Two. By the age of nine, the child is in secondary school, while according to the policy, secondary school age is eleven. According to proprietors and teachers in Sulaiman’s (2008) study, parents are the cause of

the discrepancy because they are in a hurry to get their wards out of school and into the labour market, reason being that their wards will get into the labour market early and collect returns for a longer time.

According to developmental psychologists, such as Santrock (2007), education should develop the whole child and instruction should be based on the process of learning and not what is learnt. The other aspects of development, the affective and the psychomotor are gradually being neglected. In most schools, one can significantly find nothing in the environment indicating the development of the psychomotor domain. Today's students have lost the right of playing games such as hockey, basketball, volleyball, lawn and table tennis, and even, ordinary playgrounds are missing in many schools. Teachers' emphasis is on their scheme of work, time-table and students' academic performance. Less attention is provided for the child who, in addition to cognitive development, requires affective and psychomotor development.

In addition, today's children are faced with unique and diverse challenges, with an increasingly diverse new technologies followed by varied opportunities. It has been asserted by several authors that between 10 and 20 per cent of school-age children exhibit emotional and behavioural problems (Kottler and Kottler 1993; Mental Health Foundation 1999 and Thompson and Rudolph 2000). In view of this fact and in order to help the young ones cope with the pressures of the changing society and ensure that they are adequately prepared to become the next generation of parents, workers, leaders and citizens, counselling skills and strategies are needed in schools now more than before. Contemporary counsellors (Bryan Holcomb-McCoy, Moore-Thomas and Day-Vines 2009) have ceased to see counselling as only a problem-solving process but also a preventive process. Since teachers are the only school personnel who have constant daily interaction with students and counselling is the skilled and principled use of a relationship to facilitate self-knowledge, emotional acceptance and growth, then teachers are expected to be able to use basic counselling skills and strategies to foster maximum development. Teachers are expected to coordinate instruction in such a way that a balanced individual who can think right with adequate foresight and sensitivity to human feeling and emotions develops.

Counselling is a process whereby the relationship and communication provided allows one to develop and understand one self, explore possibilities and initiate changes. Counselling is motivated by care and concern for the wellbeing of the counsellee and aims at bringing about behavioural change, problem-solving and development. Generally, counselling is perceived as a problem-solving process which is only required particularly in schools when there are problems to be solved. However, the changing world of information technology and the attendant effects on the society demand that counselling ceases to be a side attraction or something to be tolerated in schools and becomes the heart of the whole

educational system. The focus of this chapter is that counselling skills and techniques should not just form part of the training of teachers to optimize the help that could be provided to children and their parents, but should constantly be in use in the classroom. Those in charge of educational quality control are called upon to take cognizance of this aspect of the teaching and learning process. Teachers need to develop their knowledge and skills in the areas of counselling and consultation and also work more closely with parents and other professionals, more importantly counsellors and social workers, to enhance individualized instruction and improve the whole educational system. What then are the counselling skills and strategies that should be employed by teachers?

Counselling Skills and Techniques

Skill is the ability to do expertly well with artistry and fineness. Technique refers to a practical method or art applied to a particular task to attain proficiency in a practical or mechanical skill. Counselling skills and techniques entail those special abilities possessed by counsellors, which enable them to carry out the counselling relationship effectively. They are conditions that are necessary for effective counselling which should be imbibed into the classroom to enhance effective teaching and learning. The following are some of the counselling skills and techniques for teachers.

Listening Skill

Listening skill is an important counselling skill that is adopted to encourage clients to express their feelings as much as they can. The teacher does little lecturing but listens carefully and attentively to the student. The teacher obviously needs listening skill to deal with certain issues in the classroom. Rather than shout at the girl who is disturbing the class, the teacher could listen to the girl's story on what is causing the disturbance. The teacher could also teach listening skill to students through role play; and when subjects have aspects relating to listening skill, it should be stressed. Through active listening, students are taught how to understand one another as well as the teacher and the teacher shows understanding of the students' fears, stresses and anxieties. As a result of the empathy shown, the student feels accepted, more relaxed and more comfortable in the teacher's presence.

The following are essential for effective listening to take place:

- *Attentiveness* – That is, physically focusing one's attention on the person being listened to.
- *Eye Contact* – This is the most important component of listening. It is the process of maintaining good eye contact, which involves looking directly at the other person's face and only shifting one's gaze to observe any gesture or body movement. If maintaining eye contact is a problem, the speaker's mouth or nose could be gazed upon.

- *Facing Squarely* – Face the client squarely without any divided attention.
- *Leaning Forward* – Leaning forward to the person being listened to communicates attentiveness while leaning backwards gives the impression of not being interested and not listening.
- *Open Posture* – Having one's legs and arms crossed may give the impression that one is not open. An open posture of both arms and legs sends a message of open communication.
- *Remaining Relaxed* – An essential component of listening is being relaxed while adopting an appropriate posture. If a posture is not comfortable, a more comfortable posture could be assumed, but one should be steady and should not change frequently. Changing frequently may send a message of 'I am tired of listening' or 'Please, cut the story short'.
- Take appropriate body motion; for example, avoid checking your watch frequently.
- Listening is enhanced in a non-distracting environment.
- Distance between the two should not be much; be as close as possible.

The following obstruct listening skill:

- *Reassurance* – For example the teacher saying, 'Don't worry! I am sure it will work out all right'.
- *Denial of feeling* – For example, saying, 'Cheer up do not feel bad' or asking the student not to cry.
- *False acknowledgement* – For example, when you say, 'I can understand how you feel', He who feels knows, you cannot feel but can only empathize.
- *Diverting* – Asking student to talk about other things. To avoid, prevent or change the subject of discussion. There should be free association. The student should be free to say anything as it comes and the teacher must be willing and ready to listen attentively.
- *Labelling* – When the teacher says, for example, 'You are angry, arrogant or aggressive'.
- *Moralizing* – Saying, for example, It is morally wrong for you to do that'.
- *Criticizing* – Saying, for example, 'You should not have done that'.

Notwithstanding, listening skills – if and when used appropriately – serve as percussion to implement other counselling skills in the classroom.

Questioning Skill

Questioning skill is used in counselling to probe into the clients' inner selves to enable them open up for discussion or reveal what they have either been hiding or unwilling to express. Questions in counselling could be open-ended or close-

ended. Open-ended questions are also called divergent questions. Teachers will use open-ended questions to make students open up and express their feelings. For example, 'You have just said this and that, what happens next?' or 'What do you want me to do?' Close-ended questions, on the other hand, are used for confirmation, and are good for speaking out. Close-ended questions are good for clarification, exploration, filling the missing gap and for proper understanding of the client. For example, saying, 'You said your father left your mother without providing for your upkeep' or 'You said you guess your husband is having an affair?' However, the teacher is expected to use questioning with caution so that the session will not turn out to be a question-and-answer session. In addition, the teacher is expected to consider the student's level of intelligence and his/her emotional state in questioning. For example, questions should start from known to unknown and from simple to complex.

Summary Skill

Summary skill simply means tying statements together. The teacher needs to summarize the feeling and communication expressed by both parties. The essence of summary is for clarification, confirmation and correction. It can come up at any point in the counselling session; it could be at the beginning of a new session, for example, 'the last time you came, you said so and so'. It could be at the end of a session, for example, 'we have said so and so and we have decided to meet on such and such date'. Summary and questioning skills are both useful in listening skill to ascertain that the listener is attentive; and it enhances the speaker's feeling of acceptance.

Solution-focused Skill

Solution-focused Skill is the overall aim of counselling. The purpose is to ensure realistic and effective solution to the client's problem. The teacher therefore focuses on solution rather than the problem by listening, probing, diagnosing and questioning, to ensure that the root cause of the problem is found and a solution is sought. The teacher's concern should be, 'How do I get the students back to the right track and not send them out of the class or school?'

Rapport Skill

Rapport Skill is the condition of mutual understanding, respect and sustained interest which is essential to a comfortable and unconditional relationship between the counsellor and the client. The teacher is expected to develop this skill through warm reception, friendliness and cheerful mood. It is usually established at the initial stage of counselling. Hence, teachers should be hospitable from their first day in school. For example, greeting students thus: 'Good morning? how are you?' or mentioning the first name, class, or post of the student, 'You are' or

expressing compliments about the student's appearance – 'You have such a lovely dress or perfume.' Even when the appearance is against the school's norm, it should be expressed in a warm manner; for example, 'Is the school colour not blue?' and not 'Why should you put on a green cardigan?'. This gives room for warm relationship, confidence, willingness to open up and respect for both parties.

Empathy Skill

Empathy Skill is the key ingredient in helping relationship. Empathy is described as a way of being with the client and entering his or her world. It is the ability to listen to and understand the voice, thought, feelings, attitudes and experiences of the client. The student's situation should be viewed from his/her point of view. The teacher must develop empathic understanding of student, which is assuming the internal frame of reference of the student or operating along the same frequency with the student. However, the teacher should be able to separate emotion (sympathy) from empathy. Sympathy emphasizes distressed feelings while empathy does not emphasize any particular type of feeling (Egan 1998). Sympathy reflects agreement with the student's feelings and belief while empathy reflects understanding with no agreement or disagreement. For example, shedding tears because the student's story is emotional or because the student is crying is not empathy. The following are key steps to effective empathy:

- Recognizing the presence of strong feeling in the counselling setting – for example, fear, disappointment, anger or grief;
- Pausing to imagine how the student/client is feeling;
- Stating one's perception of the client/student's feeling – for example saying, 'It sounds like you are upset about....' or 'I can imagine how or what....';
- Respecting the client/student's effort to cope with the predicament, situation or problem;
- Offering support or partnership – for example assuring the student of your readiness to work with him/her through the problem;

Role Playing

Role playing is usually used to teach appropriate behaviour, new skills or to correct maladaptive behaviour. Role playing is the process of acting through play or watching somebody's character in order to effect change in the observer or the actor. The teacher could watch the act on stage or video and students could be actors. For example, it is useful to teach assertive behaviour or to correct aggression. The teacher could use role play to teach students assertiveness. For example, the teacher could ask the students to role play 'Refusal Assertiveness – that is how to say 'No' at the right time and in the right way. This is an important skill that

should be learnt by both teachers and students: to imbibe the importance of saying 'No', to keep them from being taken advantage of or doing something harmful, and not to keep them away from engaging in daily responsibilities.

Shaping

Shaping is reinforcing small steps or approximations towards a terminal response rather than reinforcing the terminal response itself. It is a way of orienting the client to begin to respond in a way that he/she has not been responding before. The teacher can use it to teach new behaviour or correct weak behaviours such as shyness or stage fright in a student. Shaping involves three important principles which are:

- Generalization;
- Competition;
- Chaining.

For example, the teacher can use it to teach learning a disabled student letter writing. He/she starts with making strokes ////////////// then \ \ \ \ \ then — — — (generalizing) then /\ /\ /\ /\ /\ and lastly letter **A** is written. At each stage, the teacher needs to reinforce in order to increase performance. Then the student proceeds to learn letter **B** and so on. This is chaining.

The teacher can also use it along with role play to reduce shyness in a student, using the following steps:

- Teacher discusses with student alone;
- Teacher discusses with student while other students watch at a distance;
- Teacher asks others to move closer and listen to the discussion between the student and him/her;
- Teacher leaves client to talk alone with other students;
- Teacher encourages client to raise discussion with others.

The steps are taken with continuous reinforcement.

Chaining

Chaining is a process whereby behaviour is divided into a sequence of response and each response is reinforced. This is a very useful technique for learning in the classroom. It could be forward chaining or backward chaining. Forward chaining is a sequence of action, taught by reinforcing the first action in the chain and working forward, each time adding a behaviour segment to the chain. For example learning letters 'A to Z'; then learning two letters 'GO, AT, NO'; then learning three-letter words. Backward chaining is the opposite of forward chaining, that is from the rear to the top, from three-letter words to two and then one letter.

Prompting

Prompting is the process of using instructions directions, examples and models to facilitate desired behaviour. They are actions that precede a response and help to initiate it. For example, at the bang of the table in the classroom, the students greet; or at the tap of the fingers, the student performs certain action(s) or counting of pebbles for addition in mathematics. Prompts could be verbal or non-verbal.

Reinforcement

Reinforcement is any stimulus or event that increases the occurrence of behaviour. Reinforcement could be positive or negative. Positive reinforcement is an increase in the probability of a desired behaviour that is followed by a desirable stimulus. For example, 'If you do your assignment as expected, you will go out to play ball' or 'If you don't leave your seat for a lesson, you will earn a gift'. Negative reinforcement is an increase in the probability of a behaviour that is followed by the removal of an aversive stimulus. For example, the bell sounds because the cell phone is on in the examination hall, the sound stops when the cell phone is switched off; so, because of the embarrassment, the phone is always switched off at the examination premises.

Token Economy

Token economy is a sort of reinforcement to foster change in behaviour. The client is expected to enjoy certain privileges beyond the essential or basic necessities of life (food, clothing and water) in exchange for good behaviour. The privilege could be a trip to the beach or place of interest or gifts. The use of token economy is guided by the following rules:

- *Token* is used as a medium of exchange like money. It is the object that is given to the student each time a desired behaviour is exhibited. For example, each time a truant comes to school, he/she is given a token, which he/she would use later to purchase a gift.
- *Back up reinforcement* is the privilege that may be purchased by the student when he/she has earned enough or the required number of tokens. This may be a trip to London, an eatery or the beach.
- *Rate of Exchange*: this is the number of tokens that is required from the client to purchase a privilege. It may be six, four, five or more.
- *Bank Hour*: Is the (specific) time of picking up tokens or exchanging a token for a privilege – for example, lunch time or after school.
- *Response Cost*: This is the punitive measure that guides the process. It is the fine imposed on the student for violating the rules and regulations of the programme. For example, if a token is not picked at the right time, the

already acquired tokens are collected. The student has to start again to obtain the required number of tokens. The teacher should ensure that the gift is worth the student's trouble; otherwise, the process may not work.

Punishment

Punishment is any stimulus that decreases the strength or frequency of behaviour. Teachers must follow the following rules for punishment to be effective:

- *Reprimand* is an expression of disapproval. It could be administered verbally or through gesture. Reprimand could be used to correct disturbance in the classroom, for example saying 'No', by shaking the head or using facial expression. Reprimand should be used quietly rather than loudly. The teacher should reprimand in such a way that only the affected student knows. A loud reprimand is prone to increase the undesired behaviour, for example, shouting, 'Will you stop it?' will not do the magic like just eyeing the concerned student.
- *Time-out* is a period of time in a less reinforcing environment following certain behaviour, that is, removing the student from an environment where he/she would ordinarily expect reinforcement and placing him/her in a situation where he/she cannot be reinforced. For example, asking the student to stay behind at lunch time to do his/her assignment while other students are outside playing or watching their favourite game.
- *Response* is the loss of reinforcers. For example, when students are given tangible reinforcers like candy for better behaviour or performance but not given when they misbehave, the reinforcer is lost, just like losing the tokens to be used for exchange in token economy.
- *Over-correction* is the fourth type of punishment procedure, and it is of two types:
 - a. *Restitution*, that is, restoring to original state: To make the offenders restore the environment or the spoilt object to its original state and now improve on it more than the original condition. For example, it can be used in a situation where the environment is damaged. When the classroom or school compound is littered with dirt or the toilet is wrongly used, the students are asked to clean it and make it even better than it was before.
 - b. *Positive Practice*, that is, teaching to act correctly: This could be used when behaviours are performed incorrectly. The student would be asked to do it repeatedly until he/she can perform the task correctly.

Extinction

Extinction is the gradual disappearance of a response that is no longer followed by a reinforcer. It is the process of ignoring undesirable behaviour and reinforcing desirable ones such that the undesirable one will disappear overtime. The use of extinction by the teacher, however, requires patience and tolerance. In the process of ignoring, there is the probability for the undesirable behaviour to increase or become worse; if the teacher deviates, the process becomes faulty. The teacher therefore must be firm when employing the use of extinction. For example, a student is asked to use the lunch period to do his assignment but rather than sitting to do it, he is crying, insisting he has to go and play. The rule is that the teacher should ignore the behaviour until the student complies. Counsellors are sure the crying is for a while; if ignored, extinction will surely take place the desired behaviour will manifest.

Assertive Therapy

Assertive therapy is a form of social skill training that teaches clients to express their needs, feelings and wants confidently without hurting themselves or others. Assertive therapy is a very useful skill that should be used in the classroom, especially for adolescents. It teaches students how to say 'NO' at the right time in the right way and with a much higher possibility of achieving the right outcome (Nwamuo 2005). The essence of learning to say 'NO' is to keep students from being taken advantage of or doing something harmful, or influencing them to keep away from engaging in daily responsibilities. Assertive therapy involves:

- Active listening to what is being said – giving the other person the opportunity to express him/herself;
- Confidently saying what you think or feel – 'No, I can't go, I'm sorry I don't attend night parties';
- Stating emphatically what you want to happen with much consideration for others' feelings – 'I hope to attend some other time if it's during the day, kindly bear with me.'

Self-control Therapy

Self-control therapy is the process of teaching an individual to re-arrange powerful contingences that influence behaviour in such a way that the student experiences long range benefits, even though he/she may have to give up some satisfaction or tolerate some discomfort at first. It involves the following process for the client:

- *Self-monitoring or self-observation*: Involves deliberate or careful attendance to one's behaviour. Teacher asks student to make a list of things he/she is doing that people are not comfortable with;

- *Self-evaluation* – comparison of what one is doing and what one should be doing. Student is asked to make a list of what he/she should be doing and he/she is not doing and then the teacher scores him/her to determine how far or close he/she is to the appropriate behaviour;
- *Self-reinforcement* – motivating self to do what one should be doing that is not maladaptive. The teacher uses reinforcement to motivate the student to see reason why he/she should behave appropriately.

The following is expected of the teacher in the relationship:

- *Motivation* – help client to establish a desirable self-control programme with adequate reinforcers that will enhance sustainability;
- *Training* – help client acquire specific behaviour change technique that will ease the process of change; for example, encouraging student to dissociate self from the group or gang;
- *Support and maintenance* – constant reinforcement of student's efforts to ensure the success of the programme. Teacher should use response cost too for violating the rules; for example, anytime a student is seen with the gang, reinforcer or token is withdrawn.

Cognitive Restructuring

Cognitive Restructuring is the process of teaching clients to think more logically and rationally, to learn rational beliefs thereby breaking maladaptive irrational beliefs. The following are some of the irrational thoughts, as outlined by Albert Ellis:

- The idea that it is extremely necessary for adults to be loved by others;
- The idea that one should be competent, adequate and achieving in all possible respects;
- The idea that human unhappiness is externally caused and that people have little or no ability to control their sorrows or disturbance;
- The idea that it is easier to avoid than to face certain difficulties and self-responsibilities;
- The idea that one should be dependent on others and someone stronger than oneself;
- The idea that one should become quite upset over other people's problems and disturbance.

The following steps are to be used by the teacher in order to assist students to begin to think rationally and not get themselves worked up unnecessarily:

- Ask student to describe a typical sequence when feeling upset. The client will outline all the irrational thoughts sequentially, stating all the 'I should', 'should have' and 'should not have' or 'musts'.
- Teach the student through the use of role play and assignment to replace the irrational self-statement with more realistic ones. Inform the student about the probability of the therapy being tedious at first but subsequently, with practice, it becomes easier.
- Observe changes in the expression of client; 'I am worthless' should have changed to 'I can still make it if I try' or 'Mine is better than so and so'.

Conclusion

The argument of this chapter is that teachers are more disposed to employ the use of counselling skills and techniques to assist students to acquire appropriate developmental skills and walk through developmental challenges because they are closer to the students in the school setting than counsellors. More important is the fact that counsellors are not yet available in all schools to promptly attend to the students' problems and other developmental/environmental challenges. Though teachers are not as professionally trained as counsellors and cannot assume the role of counsellors, they could inculcate the skills and techniques of counselling into classroom teaching as well as individual assistance in order to ensure all-round development of the child, particularly in this digital era. Teachers need these skills and techniques to ensure that all types of learning, not just cognitive but also emotional, socio-personal and physical are taking place in the classroom. The overall aim is that the task of preventing and remedying emotional and behavioural problems in schools should not be left in the hands of the counsellors alone, but digital or globalization-compliant teachers should also be actively involved to ensure all-round development.

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11

ICT and Teacher Education in East Africa

Emmanuel Olukayode Fagbamiye

Introduction

Let us begin by quoting from a poem by Khalil Gibran:

“Then said a teacher, “Speak to us of Teaching.”

And he said:

No man can reveal to you aught but that which already lies half asleep in the dawning of your knowledge.

The teacher who walks in the shadow of the temple, among his followers, gives not of his wisdom, but ... rather leads you to the threshold of your own mind.

The astronomer may speak to you of his understanding of space, but he cannot give you his understanding.

The musician may sing to you of the rhythm which is in all space, but he cannot give you the ear which arrests the rhythm nor the voice that echoes it.

And he who is versed in the science of numbers can tell of the regions of weight and measure, but he cannot conduct you thither.

For the vision of one man lends not its wings to another man.

And even as each one of you stands alone in God’s Knowledge, so must each one of you be alone in his knowledge of God and his understanding of the earth.

(Khalil Gibran 1923)

Gibran’s viewpoint of teaching seems to be extremely modern even though when he first expressed this viewpoint in 1923, learning was teacher-centred whereas the upbeat and current view is that learning should be pupil or student-centred.

According to Shulman (1987), the knowledge base for teaching can be characterized as consisting of content knowledge, general pedagogical knowledge, curriculum, pedagogical content knowledge, knowledge of learners, knowledge of educational contexts and knowledge of educational ends, purposes and values as well as their philosophical and historical grounds. For purposes of effective teaching, the point should be made that there is a need for an amalgam of content knowledge and general pedagogical knowledge to form or be transformed into pedagogical content knowledge. For instance, if one has to teach a subject such as algebra, according to Shulman (1987:114), one needs not only ‘to understand the subject matter but also how students typically grapple with such abstract content’.

Grimmett and Mackinnon (1992) reason further that pedagogical content knowledge as expostulated by Shulman is epistemologically different from the other six categories which he advanced. Even though the six categories are considered important by these authors, they express the view that teachers’ pedagogical content knowledge is a product of considered response to experience in the work place. Even though such knowledge is related to knowledge that can be taught in the lecture hall, it is nevertheless usually formed over time in the minds of teachers through reflection. It is thus individualistic and more analogous to ‘a craft conception of teaching than to one of teaching an applied science’. Simkins (1981) noted, for instance, that even though resources can be combined in a variety of different ways of achieving similar outcomes, the technology of education, with certain exceptions, is remarkably stable and is essentially a labour-intensive handicraft technology centred on the single teacher teaching a class of pupils or students. Proponents of open and distance learning will certainly disagree but it is, nevertheless, tenable. Houston (1990), Raynolds (1989), Wilson, Shulman and Richert (1987) have all tried to show that ‘knowledge base’ is a term usually associated with applied science. Wilson, Shulman and Richert (1987) state that:

... it refers to the set of rules, definitions and strategies needed by a computer to perform as an expert would in a given task environment. That set of rules is usually rather specific to a particular domain or task In teaching, the knowledge base is the body of understanding, knowledge, skills and dispositions that a teacher needs to perform effectively in a given teaching situation.

Teachers’ pedagogical content knowledge is thus a product of teachers’ responses to experience in the workplace. Even though certain aspects can be taught in a lecture room (for as Gibran has noted, ‘the vision of one man lends not its wings to another man’), individual experience is nevertheless unique in some ways. This is perhaps not surprising, given the fact that individual reaction to situations is a function of personality, experience, context and even unknown quantities about

human beings. Even though systematization is often the goal in the workplace, mechanistic regularization is not a desirable characteristic as individual reaction to situations is unpredictable and would be terribly boring if variance can be totally eliminated.

Traditional View of the Teacher

In many countries, teaching as a profession is a product of the last 100 years. Even though there were masters with their followers from the Grecian times, the idea of formal schools was an aftermath occurrence in most developing countries. There were ‘universities’ even before formal primary or secondary schools became the norm. If one took the Scottish example as a model for the modern era, the system of parish schools came into operation from about 1396 A.D (Adam Smith 1776, various editions) and had been in universal operation for 80 years in 1776 when he wrote his famous book, *The Wealth of Nations*. Adam Smith perhaps made the first major contribution to the field now known as *Economics of Education*. According to him, schools can be cheaply and efficiently run and the expense is ‘... no doubt, beneficial to the whole society, and may therefore, without injustice, be defrayed by the general contribution of the whole society’.

Nevertheless, in 1776 when Adam Smith wrote, teachers’ salaries were low, so much so that he was concerned with the quality of teaching. According to him, poor quality teaching would mean that the money of the parents and what was even of greater importance – the time and not infrequently the talents of the children – could be lost or badly affected from the inexperience and ignorance of their teachers.

Teachers could be of poor quality because the remunerations paid, particularly in developing countries in Africa, are inadequate and compare unfavourably with what others with similar qualifications and experience are paid. Furthermore, inadequately qualified and even untrained teachers are often employed to cut costs, thus negating the high ideals envisaged by Adam Smith and others like him who believe that only the best is good for children if they are to develop their potentials optimally. Even qualified teachers may be incapacitated by practices in urban centres where classes are unusually large such that effective teaching is practically impossible. A class of 120 or more students is not unusual in some public secondary schools in urban centres.

Suffice it to say that teachers in such cases are no more than keepers of the disadvantaged in society. Such a situation may come accompanied with lack of learning materials such as textbooks and, in some cases, classrooms that are totally unsuitable for teaching and learning. This scenario may further be worsened by the poor public image of teachers. Often, society looks down on teachers because they compare unfavourably with other professionals. Landlords have been known to refuse teachers accommodation for fear that they would be unable to meet

their financial obligations as and when due. A male banker would readily find a well-educated marriage partner whereas a male teacher would have to set his sight much lower. These examples may sound exaggerated, but they are real. Furthermore, teaching as a profession seems to have been disadvantaged for a long time because, in many developing countries, it constitutes the single largest workforce and entry has always been open to just any comer. For instance, according to Natukunda (2009), contract teachers can ease shortage of teachers in Africa; yet in the same vein, she admits that there is a large number of trained teachers in Uganda. However, a USAID research on educational quality improvement programme found that only 20 per cent of trained teachers in Uganda take up teaching jobs annually. This scenario is by no means peculiar to Uganda. This writer is aware that many Nigeria Certificate of Education holders and B.A/B.Sc Ed. and B.Ed. certificate holders remain unemployed in Nigeria, yet feverish efforts were made between 1998 and 2001 to train GCE/O/L holders equivalent in a crash programme for UPE schools in some parts of Nigeria, undoubtedly because of cost. Why would experts recommend the employment of unqualified contract teachers when many countries in Africa, including Nigeria, have failed to fund education adequately at all levels and have fallen short of the minimum of 26 per cent of the annual budget recommended by UNESCO, which must have based its recommendation on expert advice. Teaching, for a long time, was also dominated by females who were and, in many cases, are still perceived as the most suitable for teaching since they need time to raise their children.

Furthermore, females are naturally better suited to look after children in their formative years. This may explain why more female teachers are found at the lower levels of education while the males dominate at the higher levels. For a long time also, teachers have been usually docile and teachers' unions were not militant, partly because there was a preponderance of female teachers. In addition, it was generally believed that teachers' rewards were in heaven. Times have changed and even females are not even fooled. How is one sure in any event, that as it is on earth, it is not in heaven! After all, poverty is not synonymous with holiness.

In our own times, teachers are generally better educated and more militant, but the issue of comparatively low salaries persists in developing African countries and will continue to be so as long as the population remains youthful with a high dependency ratio. In many countries, south of the Sahara, about 47 per cent of the population is 14 years or younger and the population growth rate is higher than 3 per cent which means that the school population will continue to burgeon. Maseruka (2009) reports that 75 per cent of Ugandans are below 25 years, which explains the high population growth rate, the high dependency ratio and the high fertility rate of 6.9 children per woman. The picture painted here is not peculiar to Uganda. Similar scenarios are observable in other countries in Africa, particularly south of the Sahara. Even, countries with lower growth rate but larger population

base will continue to increase rapidly as long as the population remains youthful. Thus, the population of the East African Community will continue to increase rapidly and the demand for school places and teachers will continue to rise.

Teaching as Craft Knowledge: Teaching and Technologies in Teaching

Ryan and Cooper (1996) observe that the use of technology in the classroom is gaining increased attention as an issue in education. As society continues to embrace new forms of communication, networking and computer technologies, schools will scramble to keep up, at least in the more developed countries. But as these authors also note, the use of technology is not new to the classroom. According to them, in the early 1800s, a technological innovation was introduced to classrooms which eventually had a profound impact on teaching. Advocates termed it 'invaluable' and it was installed in classrooms throughout the United States of America but many teachers had to be encouraged to use it and the newly-formed 'normal schools' even had to introduce courses on its use before teachers integrated it into their lessons. This technological wonder was the 'chalkboard' or 'blackboard' as it was called in many African countries for several decades of the last century. The chalkboard, however, became indispensable when the classroom structure began to evolve from a room orientation to the graded classroom as it is known today.

The twentieth century brought a variety of technological devices that helped teachers use pictures in the classroom. For instance, after 1980, the filmstrip projector, overhead projector and the motion picture all provided new ways for teachers to integrate visual images into their lessons (Ryan and Cooper 1996). Such changes were considered so significant that Thomas Edison is reported to have stated that, 'books will soon be obsolete in schools as scholars would soon be instructed through the eye'. He envisioned that it would be possible to teach every branch of human knowledge with the motion picture. He foresaw a situation in which schools would be completely changed within ten years. It is now about one hundred years since Edison spoke, but books are even more ubiquitous than ever.

There have been other innovations in the classroom. For instance, educational television was introduced in 1950 as a possible method of handling teacher shortages caused by the baby boom after the Second World War. Since it was possible to bring instruction into classrooms and homes from even the most remote distances, proponents were very excited, but funding could not be sustained, even in the United States of America, and educational television has had relatively small impact. Nevertheless, television and radio have had considerable impact on distance education in many countries, notably the United Kingdom, U.S.A., India and particularly China.

Ryan and Cooper (1996) submit that, in the 1980s, another wave of innovation occurred when microcomputers became affordable. Many software products were introduced to drill students on basic skills and some visionaries even predicted the end of classroom instruction, teacher redundancy and the teaching profession as we know it. But the classroom and school are more than just venues for drilling students in skills and the teaching profession is still very much alive. Technologies will always be available to help teachers with instruction, but not to take over their role.

Over the years, many grandiose claims have been made about the use of technology to revolutionize the instructional process. But the eventual acceptance of the new technology – from the chalkboard to the microcomputer – has been determined more by the needs and demands of the classroom than by the claims of the technology advocates (Ryan and Cooper 1996). One must not lose sight of the teacher as a very essential element in any effort to enhance learning through the use of technology. The teacher's understanding and proficiency with the technology are a very crucial factor in the successful application and integration of any technology. No effort should be spared towards ensuring the adequate education of the teacher in the introduction of innovation and change. Inadequately educated teachers and unqualified contract teachers are certainly not the right kind of candidates for the learning centres of the future if developing countries in Africa are to become meaningful partners in the information age in which others are already operating effectively.

ICT Initiatives in East Africa

There is a great deal of awareness in the East African Community about the use of ICT. Various applications are visible in both the public and private sectors of the economy. Uganda, Kenya and Tanzania have National ICT policies (Centre for Educational Technology 2007). The study cited here is a collection of status reports on ICT in higher education in eight African countries including Egypt, Ghana, Kenya, Mozambique, Nigeria, South Africa, Tanzania and Uganda. The status reports show that Kenya, Uganda and Tanzania had 7.9 per cent; 1.0 per cent and 2.6 per cent internet penetration respectively as at December 2000. Even though there was significant growth in penetration between 2000 and 2007 (1285.2%; 234.2%; 1775.0% respectively), the penetration in each case is still generally low. There have also been various initiatives such as Schoolnet and Connect Ed in these countries but the use of ICT in teaching and learning is still a matter for the future. The potential is high, the awareness is high but there are various challenges to be overcome. One of those challenges is the cost of internet connectivity. In October 2009, the World Bank announced that it was to invest \$215 million to build a broadband internet infrastructure in 11 countries – Chad, Democratic Republic of Congo, Equatoria Guinea, Gabon, Niger, Nigeria, Sao

Tome, Principe, Sudan, Cameroun and Central African Republic so as to boost internet connectivity in Africa (Central African Backbone Programme). According to the World Bank, these countries currently offer the worst quality and most expensive internet services on the continent.

The cost of internet service in Uganda is said to be 150 per cent higher than the cost of the same service in the United States of America. In spite of the high cost, the National ICT Policy of Uganda noted that ‘most institutions of higher learning, both private and public, offer varying levels of ICT skills training, most as part of their programmes for formal academic qualifications’. Even though the Uganda Ministry of Education and Sports has approved a curriculum for ICT training for secondary schools and some schools are offering ICT training, there is no definite plan to train teachers, whether at the degree or sub-degree level, in the use of ICT and its integration into the teaching-learning process. In fact, the usual practice is to import a computer specialist to teach students while serving teachers remain illiterate as far as ICT is concerned. Trainee teachers at the degree level now have to take a course – Introduction to computers – a very elementary course. What is true of Uganda is, of course, applicable to Kenya and Tanzania.

The implication of the foregoing is that, even though there is awareness of the need to equip teachers with ICT skills and bring the skills to bear on the teaching-learning process, help would be needed from various sources before teacher trainees and serving teachers are equipped with the know-how to integrate ICTs into the teaching-learning process in schools in this sub-region.

Use of ICTs in Retooling Teachers in the Asian Pacific Region

If teacher trainees and serving teachers are to be equipped with ICT skills in this sub-region, one would need to look at what has been accomplished in other places. It is obvious that the task ahead of developing African countries is so enormous that it would need to be tackled in stages. The first major challenge is inadequacy of communications infrastructure. Recently, the first phase of the ICT backbone project in Uganda was completed (Tebajjukira 2009). This is part of an East African project involving several countries.

It is believed that the availability of this infrastructure will bring down the cost of Internet services in East Africa when completed. The next stage will be the provision of other infrastructural services and equipment to universities, schools, teacher training institutions and the training of serving teachers as well as teacher trainees. For instance, Microsoft sponsored the ‘Microsoft Partners in Learning Programme’ in five ASEAN countries in order to empower teachers with ICT skills. The programme was to train teachers to utilize information and communication technologies (ICTs) in five member countries of the Association of South-East Asian Nations (ASEAN) – Indonesia, Malaysia, the Philippines,

Thailand and Vietnam. What must be recognized as crucial in this programme – Partners in Learning (PIL) – is that the initiative involves corporate and community partnerships in enhancing ICT in education (UNESCO 2007). The five countries concerned launched the programme between late 2003 and mid-2005.

Basic and advanced skills training were given in the different countries. Provision was also made for on-line sharing of lesson plans and teaching materials among teachers and school leaders. School leaders were included as a significant component of effective integration of ICT in education. Modules were included on ‘Leadership in the 21st Century’ for school leaders. Expert volunteers from institutions in neighbouring countries offered their services free of charge to assist in initial and advanced training for teachers to acquire skills in ICT use.

These five case studies which focused on ‘teaching and professional development of teachers’ and other facilitators for effective use of ICT in improving teaching and learning were undertaken between 2003 and 2007 by UNESCO with support from Japanese Funds-in-Trust (JFIT). But the case studies were not isolated events, as various programmes had been implemented in the Asian-Pacific region that had focused on the capacity of teachers to use ICT effectively in teaching or that had sought to utilize ICT tools to improve teacher education, or both. Many of such programmes were said to be ‘innovative in that they have pioneered this type of training in their country or they had introduced new techniques and training procedures’ (UNESCO 2007).

In the African context, there is a great deal to learn from the initiatives in the Asian-Pacific Region. For instance, the publication which documented examples of ‘ICT in Teacher Education’ shows that the initiatives in the region may not always have been successful and are not necessarily examples of best practice. An examination of such programme initiatives will offer insights into the process of educating teachers to integrate ICT into teaching, the process of utilizing ICT in teaching and the process of initializing ICT tools for training teachers. Furthermore, these programmes provide information about the issues that are often faced in ICT-enhanced teacher education and lessons learned from past experience. Such insights are crucial so that efforts will be focused where they are needed, not on re-inventing the hoe.

It was reported recently also on the National Information Technology Development Agency (NITDA) website that Microsoft opened a partner university initiative in Nigeria on 1 February, 2008 and on 28 July, 2009, Microsoft/Federal Government of Nigeria agreed to partner in order to empower Nigerian teachers. Even though the National Policies on IT in Nigeria and the National Policy on ICT in Uganda, Kenya and Tanzania mention education, none of them actually mention empowerment of teachers. The usual practice is to focus on ICT curriculum for schools but teachers who should be the pivot are nowhere mentioned. So, this clear reference to empowerment of teachers is very welcome.

The Way Forward

The reality on the ground in East Africa, and of course in many African countries, is that there is awareness that ICT could improve the teaching-learning process. But there are many other hurdles to cross before concrete steps can be taken to actualize what is desirable. From studies conducted recently (UNESCO 2007):

... it is evident that information and communication technologies (ICT) can help to broaden access to education and improve learning outcomes, Research has also shown, however, that success in the use of ICT in education depends largely on teachers and their level of skill in integrating ICT into the teaching process and in utilizing ICT to provide learner-centred interactive education. Therefore, training teachers to be able to use ICT and to integrate ICT into teaching is crucial for achieving improved educational outcomes with ICT.

Once a technology enters the classroom, the uses to which it is put are affected by what has been described as the technology's level of maturity. As Ryan and Cooper (1996) have observed, in education as in other fields, new technologies tend to go through three stages of application. In the first stage, the technology is applied to things teachers already do. For instance, when microcomputers were first introduced into schools, computer programmes were created to stimulate flash cards for mathematics drill. In the second stage, the microcomputer was used to improve on other tasks done by teachers. For instance, a more sophisticated mathematics software application can provide remedial instruction when a student makes the same mistake more than once. More topics could also be covered using the same procedure. At the third stage of maturity, the technology is used to do things that were not possible before. This is the stage at which teachers, having internationalized the technology, can now use it innovatively rather than just using it to do old things in a new way as in the first stage.

Such applications as word processors, databases, spreadsheets, telecommunication tools, tutorials, simulations, multimedia software, drills and practice programmes can enhance students' cognitive skills. Writing with word processors in language education, learning to read, enhanced problem solving, learning science, interdisciplinary approaches to learning, distance education and special education applications are unlimited. Furthermore, teachers can be relieved from many routine tasks and can focus on higher order evaluation of performance. The teacher can properly take on the role of leader and co-learner; from the role of dispenser of information to facilitator of students' learning. Record keeping and administrative tasks are easier to handle and information retrieval makes service delivery very pleasant and satisfying.

Conclusion

Efforts have been made in this chapter to show that teachers will remain relevant and cannot be displaced by technology. Even when new technologies are introduced, the effectiveness of their use will depend on the knowledge and skill of individual teachers to integrate them into the teaching-learning process. The ability of the teacher to domesticate the pedagogical content knowledge is a function of the individual's intelligence, skill acquired through training, personality and experience over time in an environment, and cannot be treated as mechanical. Resistance to the use of new technology is real but it can be overcome if all stakeholders – school leaders and teachers – are jointly socialized and acculturized.

Finally, the greatest challenge in the use of ICT in East Africa is going to be sustainable funding – from provision of infrastructure, computers and software to training of users which must be continuous and renewable, as one has to keep on running to stay in the same place.

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12

Integrating Technology into Social Science Teacher Education in Nigeria

Biodun Ogunyemi and Alaba Agbatogun

Introduction

Technology is ubiquitous. It touches every aspect of human life including politics, economy, arts and culture, and education. From ticketing at train stations, operating a television set, reaching out through the general system of mobile communication (GSM), to booking and paying for an airline's flight, and many more, there is hardly any activity that can be accomplished in today's world where some level of technological know-how would not be required. The twenty first century is therefore justifiably described as 'the age of technology' in view of its increasing technological transformation of human life.

While advancement in Information and Communication Technology (ICT) continues to propel economic, political, social and educational reforms in many countries (Jhurree 2005; Ololube 2006), it is in the field of education that its integration is perhaps most challenging. In schools, colleges and universities, a major requirement for a facilitative academic environment today is digital presence. It is now realized that a technology-enriched learning environment is indispensable when trying to equip learners with the skills, ideas and information required for training them to become critical thinkers, collaborative peers and technology literates (Abdelraheem and Al-Rabane 2005; Angers and Matchmes 2006). For both teachers and learners, the digital revolution is transforming the traditional classroom from an uninspiring, laborious and tasking setting to a facilitative, expressive and collaborative teaching-learning environment. A teacher's role as the guide and stage-manager in the emerging digital context cannot therefore be overstressed. Indeed, effective integration of technology into teacher education is a critical variable in the production of competent and dynamic teachers of the twenty first century.

The challenge of technology integration is especially more pronounced in social science teacher education, in view of its philosophical and pedagogical foundations. At the school level, social science subjects (economics, geography, government, history, social studies) are designed to introduce the young minds to thought systems, events and activities which have immediate and remote implications for the quality of human life. Learners are to understand and appreciate some basic concepts and principles guiding human survival, such as alternative use of resources (economics); distribution and changing patterns of phenomena in space (geography); organized contest for power (government); perspectives to interpreting the past (history); and interdependence of human and natural elements of the environment (social studies). As a society-focused discipline, social science requires teachers who are not only skilled in accessing and using state-of-the-art technologies, but are sufficiently grounded to tap into the global reservoir of the dynamic knowledge society (Ogunyemi and Ifegbesan 2000; Ogunyemi and Ogunsanya 2005). The conventional setting for social science teacher education cannot meet this demand as it is dominated by the use of textbooks and teacher-talk.

Awareness for technology integration among social science teacher educators is rising and this has begun to translate into curricular review and improved context for pedagogical preparations of pre-service and in-service teachers. In particular, the college/university environment is being challenged to transform from the teacher-centred scenario to student-centred, participatory, interactive and collaborative learning situations (Erekson and Shumway 2006; Kainth and Kaur 2009). However, while the availability of computer technologies in schools and tertiary institutions is on the increase, both in developed and developing countries, many teachers and faculty members are yet to be fully empowered to adopt best practices in the technology-driven classroom environment.

As argued by Good, O'Connor, Greece and Luce (2005), social science teachers and teacher educators need to embrace the changing content and context of their practice in the digital age. But how can these be achieved through technology integration in teacher education? What is the state of teacher education, particularly in Nigeria today? What are the prospects and challenges of technology integration in social science teacher education? These are some of the questions addressed in this chapter. Our goal is to sensitize teachers (both pre-service and in-service) as well as teacher educators to the implications of the digital revolution for improved teaching and learning at the school and teacher education levels.

Teacher Education in Nigeria

Teacher education is a training process designed with the primary aim of providing requisite skills, knowledge, values and experiences that will produce highly motivated, conscientious and successful classroom teachers who can in turn

produce successful students for improved education quality and national development (Ololube 2006). It is a process that improves the quality of teachers for professional growth. It has therefore been argued that quality education is dependent on effective teacher education (Lawal 2003).

The world over, teacher education is witnessing serious overhaul as part of the general reform process dictated by the increasingly changing educational environment. The transition from military dictatorship to representative democracy, as from the 1990s, has particularly changed the face of the African society in general and African education in particular. Within this context, innovative dimensions are increasingly being introduced into educational programmes at the pre-primary, primary, secondary and tertiary levels. National policies on education are consistently being reviewed to further articulate the desired innovations governments would want implemented.

In Nigeria, the foundation for teacher education reform is located in the numerous changes and innovations that are taking place in the country. According to the National Policy on Education (NPE), such changes include the lifting of the suspension order on Open and Distance Learning; introduction of Information and Communication Technology into the school system; prescription of the minimum number of subjects to be taken by the Senior Secondary School Certificate Examination (SSCE) candidates; and general contextual change to reflect the state of the professional practice in education (Federal Republic of Nigeria 2004). Within this broad context, the emphasis placed on teacher education derives its basis from the unassailable fact that 'no educational system may rise above the quality of its teachers' (Federal Republic of Nigeria 2004). As part of this quality enhancement process, the Nigerian Government, as from the 1980s, started phasing out teacher education programmes such as Grade III/II certificates and Associateship Certificate of Education in favour of the Nigeria Certificate in Education (NCE) as the minimum qualification for practice.

Teacher education in Nigeria is provided by faculties and institutes of education of various universities, schools of education in the polytechnics, the National Teachers' Institute, National Institute for Nigerian Languages (NINLAN), National Mathematical Centre and the colleges of education, the National Commission for Colleges of Education (NCCE), the National Universities Commission (NUC), and the National Board for Technical Education (NBTE) are coordinating bodies that accredit teacher-education programmes in Nigerian institutions (Abolade and Yusuf 2005; Ololube 2006). Against the backdrop of the ongoing educational reforms, the Nigerian Government states the goals of teacher education as to:

- a. Produce highly motivated, conscientious and efficient classroom teachers for all levels of our education system;

- b. Encourage further the spirit of enquiry and creativity in teachers;
- c. Help teachers to fit into social life of the community and the society at large and enhance their commitment to national goals;
- d. Provide teachers with the intellectual and professional background adequate for their assignment and make them adaptable to changing situations;
- e. Enhance teachers' commitment to the teaching profession (Federal Republic of Nigeria 2004: 39).

In addition to the above-highlighted goals, the NPE states: 'Teacher education shall continue to take cognizance of changes in methodology and in the curriculum. Teachers shall be regularly exposed to innovations in their profession' (Federal Republic of Nigeria 2004). The import of this official position is that teacher educators across the disciplinary divides must constantly reflect modern trends in their training and re-training of teachers if they are to operate within the national framework. Kainth and Kaur (2009) reiterate that the issue of ICT integration in teacher education is gaining attention because of the pressure on institutions of learning in developed and developing countries to adopt effective use of technology so as to meet the needs of the twenty-first century learners. Iyamu and Aduwa-Ogiegbaen (n.d.) indicate that the Nigerian Government has made concerted efforts to initiate internet connectivity in institutions of learning, as well as engage teacher educators in series of training in order to broaden their knowledge and skills in the effective use of computer technologies for instructional purposes. UNESCO (2002) reports that teacher education institutions are currently under pressure and face the challenge of preparing a new breed of teachers to effectively use technological innovations in their teaching practices. Consequently, curricular policies, professional development, workshops and seminars are designed by the various arms of government to improve teachers' disposition towards technology use in schools. The extent and impact of these efforts are yet to be fully determined, with respect to technology integration into the social science classrooms in the Nigerian environment.

Technology in the Social Sciences

Social sciences deal with social phenomena that are sometimes difficult to express, explain and describe effectively without the support of pictorial, graphic, audio and audio-visuals (Abdelraheem and Al-Rabane 2005). In view of the limitations of the traditional method of teaching social science subjects which leaves no opportunity for learners' active participation in the classrooms, social science educators and researchers are deeply concerned about producing teachers who are inadequately prepared for challenging integrative and active teaching (Thornton 2001). VanHover, Berson and Swan (2006) remark that social science educators tend to use the same teaching technique (textbooks, lecture method and body

language) over the years and yet expect to experience unprecedented positive changes in learning outcomes, whereas the input has not changed to ensure improvement in such expected output.

Technology-driven social science classrooms have great potential of exposing students to a myriad of academic opportunities. Technologies that have been made available in recent times are capable of offering students unlimited opportunities to global connection and networking, as well as engage them in actively 'doing' the social science from the analytical perspective and disciplinary knowledge orientation (Barton and Levstik 2004; Sexas 2000; VanHover, Berson and Swan 2006). Similarly, for quality instruction in social science subjects like geography and social studies, geographical features and data could be better and more meaningfully presented using PowerPoint to stimulate students' understanding and improve their experience.

Hofer and Swan (2008) have reported that social science education witnessed an era of restricted access to geo-spatial data on traffic and weather, purely because instructional processes were based on didactic teaching approach. They remark that the advent and use of Geographic Information System (an information software that enables storage, retrieval, manipulation and display of geographical data such as aerial photographs and satellite images) gives teachers and students the opportunity to analyze and address a series of educational inquiry (environmental challenges, hazards, crimes, etc.) in schools. The transformative effects of such innovative teaching at the teacher education level cannot be quantified.

Teachers' Place in Technology Integration

Social science educators have advocated the integration of ICT within the spectrum of social science instruction (Keegwe 2007). The idea of technology integration has been misconstrued by lots of people as teachers' ability to use technology. Angers and Matchmes (2005) indicate that to 'integrate' implies incorporating technology into the instructional process so as to engender effective teachers' teaching and learners' learning. Dockstader (1999) remarks that technology integration does not imply having the technology drive the curriculum; rather, it indicates situations that are having the curriculum drive technology usage. Painter (2001), however, notes that technology integration requires teachers' readiness and flexible ability to incorporate technology into teaching activities with a high level of teaching skills based on curriculum knowledge, knowledge of students' abilities, students' needs and reasonable level of technology literacy. The International Society for Technology in Education (1999) identifies three primary principles of infusing Information and Communication Technology into teacher education. These are:

1. ICT should be holistically infused into teacher education programme;
2. ICT should be introduced in context; and
3. Learners should be exposed to innovative technology support in teacher education programme.

It is obvious from the above principles that teachers are not expected to be seen within the education system as knowledge dispensers or repositories of knowledge, but rather as facilitators of learning. The role of the teacher in integrating technology into the teacher education programme goes beyond merely having knowledge about the computer technologies and software, but having the required and well-thought-about information, skills, ideas to construct new knowledge and ability to effectively infuse technology into the instructional process (Kainth and Kaur 2009; Morehead and La Beau 2005). Technology integration thus becomes a reality only with teachers' ability to effectively use the technology technically and pedagogically (Achcoso 2003). The presence of technology in the school will not automatically enhance teaching and learning without teachers' necessary input. Angers and Machtmes (2005) emphasize that teachers' adjustment of mind-set, readiness, positive disposition to technology use and reasonable level of competence in technology use for instructional purpose should be part of the basic elements of the teacher education programme.

Need for Technology Integration into Teacher Education

Schools, colleges and universities in Africa are just beginning to explore the potentials computer-technologies offer teachers and learners. Technology integration into classroom instruction goes beyond mere teaching and learning of basic computer skills and software programmes in a separate computer class. Mason et al (2000) opine that social studies teacher educators who infuse technology into the teaching and learning process offer learners ample opportunities to explore the potentials of technology and expose them to the various dimensions of changes technology brings to the teaching profession and all facets of life. Specifically, technology integration should be directed towards supporting learners' active engagement, participation in groups, integrated interaction and immediate classroom feedback. In other words, technology in the classrooms makes the learning environment and instructional process more student-centred; hence students are engaged in high-order thinking because of practical exposure to the societal 'real world' (Alexiou-Ray, Wilson, Wright and Peirano 2003; Friedman and Heafner 2007).

The learning environment complemented by the use technology facilitates social interactivity and reflective community practice. This strategy fosters learners' self-regulated learning while teachers mostly act as facilitators, monitors, coordinators or classroom referees (Kozma 2003; Ryba and Brown 2000). In essence, the role of the teacher in the classroom is being modified from being a dispenser of knowledge to being a partner in the learning process. Technology

therefore provides opportunities for learners' connections because social science subjects cannot be taught in isolation (Erekson and Shumway 2006).

The presence of technology in the classroom, however, is not a direct replacement of teachers' roles in the instructional process, but rather a means to supporting the instructional process to attain objectives that would not have been possible without technology (Jhurree 2005). Technology in the teacher education programme is a powerful tool for teacher educators to stimulate students' interest in the field of social science. Lessons can be made more understandable and explanatory to students, thereby promoting learners' inquisitiveness. The integration of technology into the teacher education programme allows teachers and pre-service teachers to organize teaching in a way that is more efficient and easy to follow. Teachers also have the opportunity to network with colleagues from different parts of the country and the world so as to have their experiences and skills shared (Marwan 2008).

Newhouse (2002), cited in Ololube (2006), argues that if technology has been developed to improve living standards and increase productivity, it follows that educational technology has been developed to cause such effects in the education sector. This implies that teachers' choice of appropriate technology for the instructional process has greater opportunity of optimizing students' learning with increased valued outcomes. One of the greatest benefits of technology in teacher education is that it activates learners' senses during the instructional process. Learners in a technology-oriented learning environment have the opportunity to make use of their senses in such a way that they develop their personal, intellectual and creative abilities (Iyamu and Aduwa-Ogiegbaen n.d.).

Approaches to Technology Integration

Technology integration into teacher education could be approached from different perspectives (Kainth and Kaur 2009). Some of these approaches are discussed below:

ICT Pedagogy Approach: This is an approach that is directed towards broadening the knowledge and understanding of pre-service teachers on effective technology integration methods so as to boost their computer self-efficacy and competence. The main target of this approach is to expose the pre-service teachers to a degree of understanding about the 'why' and 'how' to integrate technology skills in school subject teaching and learning, thereby exploring the potentials of constructivism principles.

Practice-driven Approach: The focus of this approach is not mere theoretical use of ICT but rather practical exposure to ICT use and realistic exploration of technology potentials. With this, social science teacher educators have wide opportunities to access technology facilities available at workplaces, demonstrate effective use of the facilities and improve on personal skill activities designed in conjunction with the cooperating teacher or tutor-teacher and eventual management of such activities within the classroom settings.

ICT Skills Development Approach: The objective of this approach is mainly to equip the pre-service teachers with skills, information and training about the general use of both software and hardware to facilitate effectiveness in the educational process and context.

Subject-Specified Approach: Technology can be infused into specific subjects. Through this approach, the social science educator introduces learners to a new method of learning and an exposure to active, practical-oriented and experiential learning via technological devices. This type of approach gives the teacher and students access to technology during the instructional process. The summary of these models or approaches is presented in Table 12.1.

Components and Principles of Effective Technology in Teacher Education

To effectively integrate technology into the teacher education programme, there is the need for a practicable implementation plan that puts into consideration the actual institutional needs. According to Levine (1998), cited in Jhurree (2005), the major components of the technology integration plan within the education system include: formulating a planning team; collecting and analyzing data; formulating the visions and objectives; and, exploring available technology. Others include determining training and staffing needs; determining budget and funding sources; developing an action plan; implementing the plan; and, evaluation. In order to effectively integrate technology into the social science teacher education programme, Mason et al (2000) propose the following principles:

Extend teaching beyond what could be done without technology

The conventional learning environment is becoming insufficient to meet the needs of learners and educational goals. Social science teacher educators can explore the potentials of technologies by exposing learners to activities and tasks that require more of learners' active participation and a more meaningful learning situation which are absolutely missing without technology. For instance, historical digital archives can be developed at the state and federal levels while schools, colleges, universities, libraries and the general public are given access to the digital archives. Information, materials, ideas and skills are also made available to students via the World Wide Web. Furthermore, the digital archives can contain past newspapers, letters, diaries, photographs, military records, historical data, census electoral and immigration documents and information.

Introduce technology in context

There is a difference between acquiring technology competence skills and possessing the skills that allow effective use of technology to enhance the instructional process. Social science teacher educators must realize that pre-service instruction that will empower teachers to effectively infuse technology into lessons is more beneficial

Table 12.1: Approaches to Technology Integration

Integration Approach	Format	Features	Limitations
Skill Development Approach	One or more unit dedicated to relevant ICT skills and competencies	<ul style="list-style-type: none"> • Opportunities for students to gain ICT skills regardless of their past experience. • Potential to transfer to the classroom • Emphasis on basic computer operations and programmes 	ICT units and skills are viewed by students as discrete components of their programs <ul style="list-style-type: none"> • ICT skills are perceived as targeted learning outcomes without any emphasis on their applied values to the classroom • Research does not indicate any evidence of skill transfer to classrooms
Pedagogy Approach	Inclusion of one unit or more to teach students how to integrate ICT into their teaching	Opportunities to learn ICT skills as well as how to implement them in the classroom <ul style="list-style-type: none"> • Potential to transfer to the Classroom 	ICT skills are perceived as targeted learning outcomes without any emphasis on their applied values to the classroom <ul style="list-style-type: none"> - Research does not indicate any evidence of skill transfer to classrooms
Curriculum Units Approach	Inclusion of specialized software within the curriculum unit Classroom	Opportunities to model to participating students actual integration within authentic settings <ul style="list-style-type: none"> • Potential to transfer to the Classroom 	Use of software as tools for learning rather than as medium of learning <ul style="list-style-type: none"> • Confining the use of the specialized software to particular curriculum areas rather than the classroom as a whole
Practice-driven Approach	Inclusion of the design ICT resources to be used in their practicum experience	Opportunities to the student-teachers to monitor their own learning through the use of tools such as digital portfolios	Limited to student-teacher professional learning <ul style="list-style-type: none"> • Dependent upon student teacher's prior ICT experience

(Synthesized from: Albion 2000; McNair and Galanouli 2002; Watson, Proctor, Finger and Lang 2004; Karagiorigi and Charalambous 2006)

than teaching the teachers how to use some specific computer skills. For instance, it is far better for social science teacher educators to be equipped with skills needed to effectively create and use PowerPoint presentations to enhance effective teaching and learning of topics than just knowing how to create PowerPoint.

Include opportunities for students to study the relationship between science and technology, and society

Interactive technology such as the internet has greatly increased individuals' access to information online. It has clearly established a strong relationship between science and technology, and society. Lots of developed and resource-rich countries have wide access to knowledge while the developing countries are poorly connected as a result of the impact of low internet access rate. Despite the convincing benefits of the internet in education, there are still some inherent dangers and risks attached to the young people's use of the World Wide Web. Anti-social information based on issues like gun crime, pornography, drugs, alcohol, e-fraud, illegalities and some other criminal information are available online for youths to access. Unfortunately, many of these youths are not adequately equipped to differentiate between right and wrong information. There are therefore great concerns as to how young people will be able to manage the risks they access online in order to exhibit reasonable level of societal moral conduct. It must constantly be stressed that students' global connectivity should not be celebrated at the expense of the cherished community values and peaceful human interrelationships.

Foster the development of the skills and knowledge to participate as good citizens in a democratic society

One of the main goals of social studies and social sciences is preparing students to take on the role of effective citizenship. To a large extent, the misconceptions about citizenship education are best clarified and revitalized within the school setting by exploring the potentials of various interactive technologies. Unfortunately, many social science teacher educators have been found to underutilize technology, even in their classrooms. There is therefore the need to demonstrate the power of technology to social science teachers, especially on how technology can effectively support citizenship development activities. Mason et al (2000) summarize these activities as 'development of personal and civic beliefs; capacity for social and public actions; development of ties to their localities and the world outside; and awareness of past, present and future'.

Conditions and Challenges for Promoting Successful Technology Integration

Successful integration of technology is guaranteed if teachers perceive technology as relevant in teaching and learning (Angers and Matchmes 2005). Skill development in technology usage requires commitment and the courage to adopt innovations.

Alexiou-Ray, Wilson, Wright and Peirano (2003) remark that for technology to be successfully integrated into the curriculum, teachers must be fully equipped with the necessary tools and skills required to make them functional in technology-oriented classrooms. Jegede (2009) reiterates that teachers' training in technology usage should go beyond mastering computer hardware, basic software and keyboard practice; such training should be extended to web and e-learning skill, computer-assisted instruction and computer-managed learning, among others. Hence, teacher educators should be moved from 'learning to use technology' to such essential and needed stage of 'using technology to learn'.

Titterington (2000) emphasizes that 'integrating technology into teaching is more or less like leaving the comfort zone, based on personal or individual commitment'. Successful integration of technology happens when teachers are prepared for it (Jegede 2009). Social change is neither a sudden nor a drastic event, but rather a gradual process. Therefore, teachers need ample time to learn the techniques of new technologies and the processes involved in integrating such technologies into the instructional process. Teachers should be given the opportunity to develop and implement activities that are driven by technology during the instructional process to allow for proper technology integration (Gulbahar 2008).

Several challenges could hinder teacher educators from effectively integrating technology into the teacher education programme. As a matter of fact, social science educators are lagging behind in utilizing technological innovations for instructional purposes (Anderson 2001; Becker and Wong 2000). Many teachers are hesitant to use technology during teaching and learning because of the teachers' low level of computer competence, and lack of computer experience and technology integration still within the educational setting. When teachers are trained, they develop technical expertise and improve in experience as they infuse technology into their classrooms. The horizon of teachers is widened as they are exposed to a wide variety of software programmes that are useful in enhancing effective teaching and learning (Zhao and Hoge 2004). Teachers are inhibited from effectively integrating technology into the teacher education programme when they lack easy and frequent access to technology equipment (Friedman 2006; McGlenn 2007; Norrris, Sullivan, Poirot and Solway 2003). This is a major source of hindrance in the Nigerian environment.

Angers and Matchmes (2005) argue that leadership is a significant factor that influences effective integration of technology in teaching and learning. Administrative heads of schools need to be committed to discussing how technology can be effectively used in their schools to achieve improved learning. Hofer and Swan (2008) recall that few teachers are familiar with many of the available technology hardware and software, while many teachers do not have sufficient time to develop technology-based lessons. Furthermore, Morehead and La Beau (2005) report that some teachers are myopic about the relevance of

technology to education and this is a great obstacle to effective integration of technology into teacher education. Teachers sometimes view technology as disconnected from the curriculum because of the popularity, high level of acceptance and use of textbooks in the education sector. Jegede (2009) remarks that though considerable training is given to teacher educators with the primary aim of equipping them with the necessary ICT skills for personal and professional practices, many of them still find themselves wanting in teaching with ICT in schools because they were not exposed to an ICT-immersed curriculum in their professional preparation.

Conclusion

In summary, it can be seen that technology integration is indispensable to meaningful social science education in the twenty-first century which is widely regarded as the digital age. The increasing popularity of technology in education worldwide places a lot of challenges on the Nigerian nation. As the country aspires to become one of the 20 leading world economies by the year 2020, she must borrow from and adapt best practices from around the globe and intensify efforts at integrating ICT into her teacher education programmes. With increased funding, judicious utilization of resources, capacity building for teacher educators and proper monitoring and evaluation, the initial problems can be reduced to a tolerable minimum to usher in an improved regime of technologically-enriched social science education in Nigerian schools, colleges and universities.

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13

Pedagogical Integration of Technology into Science, Technical and Vocational Education

Blessing Adeoye

Introduction

Technology is an integral part of human lives and increasingly present in African societies. It has been introduced to varying degrees in all educational disciplines, especially in science, technical and vocational education. At the dawn of the twenty-first century, technology is becoming more vital to the society. Technology can be used to perpetuate a teacher-led, knowledge-based learning approach, or it can be used to help implement a student-centred, constructivist and progressive approach. Computers are also becoming more affordable and are indispensable to many people in their daily activities. Investing in technology, with proper training of teachers, provision of modern and quality equipment, and software in each classroom, would be a major gain in preparing students for the future. Improving teaching and learning is the key to integrating technology into the classroom. Technology integration is also very important because once a teacher is well prepared, he/she would be able to implement the use of technology across the curriculum. It is important to understand that technology is a tool for teaching and learning, and not a strategy. In other words, being proficient in the use of the technology tools does not guarantee success. However, teachers who integrate technology effectively can increase students' learning opportunities, efficiency, productivity and learning outcomes.

The integration of technology into an educational setting is, in many ways, like its integration into any business setting. Technology is a tool to improve productivity and practice, whether in an educational setting or in a business. Therefore, measures need to be available to assess effectiveness, even when some of the most significant effects can be difficult to measure. Technology integration in the classroom has

the potential to support important educational goals. Technology, it has been argued, helps change teacher-student relationships, encourages project-based learning styles, and supports the acquisition of skills such as 'higher order thinking', analysis and problem solving (Dockstader 2008). It is very important to recognize that pedagogical integration of technology is to better understand how the use of technology can improve the quality of teaching and learning.

What is Technology Integration?

Technology integration is the incorporation of technology resources and technology-based practices into the daily routines, work and management of schools (Dockstader 2008). It involves using computers effectively and efficiently in the general content areas such as mathematics, science, reading and social studies to allow students to learn how to apply computer skills and technology in meaningful ways. As a result, the curriculum drives the use of technology, not vice versa. Integrating technology goes far beyond using computers to supplement a lesson in the form of presentation or word processing software (Dockstader 2008). When teachers effectively integrate technology into their classroom practice, learners are empowered to be actively engaged in their learning. According to edutopia (Dockstader 2008), students who are instructed with technology are more likely to retain information and develop a deeper understanding of concepts.

Successful Technology Integration

The world is changing so fast today that with sufficient basic science and technology, nations can aspire to catch up with modern developments. The integration of educational technology will be a hollow achievement unless it is done properly and effectively. New technologies constitute not only a set of tools but also an environment – a space (cyberspace) – in which humans interact.

There are many successful stories of technology integration. Maslin and Nelson (2002) view technology as the enabler for students and educators to create significant projects collaboratively. Today's student needs to be literate across a variety of communication technologies (Merlkey, Schmidt and Allen 2001). Riley, Holleman and Roberts (2000) conclude that schools employing effective technology integration have shown positive results for both teachers and students. They report that teachers were better able to assist students in comprehending difficult concepts and better able to individualize instruction for students' needs. Also, Wepner and Tao (2002) discovered a common belief among teachers that computers were a valuable source of information, motivation and presentation. One of the participants in their study used technology to develop content knowledge and problem-solving skills, and participating teachers used multiple sources in teaching. Clark (2000) also reported that technology assisted teachers significantly in accomplishing routine tasks. As the enormous benefits of technology

were realized, it is also important to note that the incorporation of technology is not without complexities. The following section presents some challenges of technology integration.

Challenges of Technology Integration

The use of technology for the explicit purpose of integrating the school curricula often carries the implicit aim of introducing students to the concept of globalization. As a result, the conscientious educator confronts a number of challenges. For instance, the provision of instructional materials for use in schools today is faced with serious difficulties from various directions. Schoepp (2005) indicated that the act of integrating ICT into teaching and learning is a complex process and one that may encounter a number of difficulties. These difficulties, according to Schoepp, are known as barriers. A barrier is defined as any condition that makes it difficult make progress or achieve an objective (WordNet 1997, as cited in Schoepp 2005:2). According to Bingimlas (2009), the major barriers are lack of confidence, competence and access to resources. Since confidence, competence and accessibility have been found to be the critical components of technology integration in schools, ICT resources, including software and hardware, effective professional development, sufficient time and technical support need to be provided to teachers. The presence of all components of technology increases the possibility of excellent integration of ICT in learning and teaching opportunities.

The most prominent difficulties in many developing and underdeveloped nations are found in lack of sufficient funds to procure all the essential materials needed and the lack of electricity to enable classroom teachers operate tools, if provided. In addition, the negative attitudes of many teachers in handling instructional materials constitute further problems. Other researchers indicated that integrating ICT is a gradual, reflective process for most teachers; it is also influenced by a complex mix of factors. For instance, in Kerr's (1991) study, participants indicated that incorporating technology into the practice allowed obvious and dramatic changes in classroom organization and management, yet changes in teacher pedagogical thinking were slow. However, Hennessy and Deaney (2004) indicate that a gradual but perceptible process of 'pedagogical evolution' appears to be taking place, involving both pupils and teachers developing new strategies and ways of thinking in response to new experiences and the lifting of existing constraints. Hennessy and Deaney (2004) also indicate that new approaches must be compatible with existing pedagogy and be perceived as meeting a need.

Innovation and adaptation are costly in terms of time; developing effective pedagogy around ICT involves significant input in terms of planning, preparation and follow-up of lessons (Cox, Webb, Abbott, Blakely, Beauchamp and Rhodes 2003). Other contextual factors which can act as barriers to technology integration include lack of confidence, experiences, trainings and access to reliable technology

resources (Dawes 2001). Loveless, DeVoog and Bohlin (2001) found that practice develops over time and this process is not automatically triggered by simply sharing information with colleagues. It entails developing ideas and trying them out, considering the principles and purposes that underpin activities in particular contexts, and critically reflecting on them.

Hennessy and Deaney (2004) identified the organizational factor, motivational factor, and pedagogical factor as the ones which variously influenced the processes of evolution over time, and dissemination of practice for the teachers.

- *Organizational Factor:* Extrinsic organizational factors or whole school characteristics were found to have the biggest motivating influence on both sustainability/development and dissemination of ICT-supported practice. Access to technology resources was the most frequently mentioned factor in this group. Teachers' comments highlighted the need for accessibility and flexibility of use over and above quantity of machines. In particular, provision of interactive whiteboards and data projectors has positive impacts on the development of practice, enabling teachers to model processes, using students' work to work more collaboratively with the whole class and 'have a dialogue while working' rather than merely 'giving them instructions'.
- *Motivational Factor:* Two internal or intrinsic factors, namely teachers' technical confidence and confidence in approach also played a key role, although they were linked twice as often to dissemination, and thus more to colleagues' confidence levels. The teachers involved in their study, while not being experts initially had subsequently used ICT regularly for three years and might therefore have developed their confidence to higher levels than colleagues that were just using it. Technology skills and experience, resistance to change, and teachers' age (younger teachers were construed as natural and innovative users of ICT) were also influential.
- *Pedagogical Factors:* According to Hennessy and Deaney (2004), all of the teachers and colleagues considered the practices they had developed to be largely successful in terms of enhancing pupils' learning (three times more often in relation to development than to dissemination). Pupil motivation was likewise an important factor concerning development and, to a lesser extent, dissemination. These findings resonate with other recent work concerning the critical impact of teacher beliefs about the benefits of ICT use for students in the classroom (e.g., Cox et al. 1991; Ruthven, Hennessy and Brindley 2005; Tearle 2004).

Furthermore, teachers exhibited a strong desire to develop effective practice which benefits pupil learning. Their skill and confidence in using technology and inclination towards the pedagogical approach were also contributory motivating factors, although barriers emerged where these were lacking. In both cases,

however, proactive support from more experienced colleagues (and ‘seeing what was possible’) offered mechanisms for facilitating take-up of new strategies. As stated by Hennessy and Deaney (2004), exploiting this support was, in turn, encouraged or constrained by organizational factors and a whole school culture which valued and promoted ongoing collegial activity. Also, it is important to look at learning theories related to technology integration because understanding the way that students learn (e.g. learning styles) should help in selecting relevant technologies for their learning activities to ensure they learn effectively.

Learning Theories related to Technology Integration

In reviewing the pedagogical use of technology, several learning theories and philosophies are involved. Three main theoretical schools or philosophical frameworks that are very popular and relevant in education are behaviourism, cognitivism and constructivism. Each of these schools of thought is still present in today’s literature. These are presented below as explained by Sewall (2009). Also, another one that was added later by George Siemens and Stephen Downes is ‘connectivism’.

Behaviourism

This theoretical framework was developed in the early 20th century with the animal learning experiments of Ivan Pavlov, Edward Thorndike, Edward C. Tolman, Clark L. Hull, B.F. Skinner and many others. Many psychologists used these theories to describe an experiment with human learning.

Cognitivism

Cognitive science has changed how educators view learning. Since the very beginning of the Cognitive Revolution of the 1960s and 1970s, learning theory has undergone a great deal of change. For instance, it includes research on how information is processed (in faculties such as perception, language, reasoning and emotion), represented, and transformed in a (human or other animal) nervous system or machine (e.g. computer). Cognitive science consists of multiple research disciplines, including psychology, artificial intelligence, philosophy, neuroscience, linguistics, anthropology, sociology and education. It spans many levels of analysis, from low-level learning and decision mechanisms to high-level logic and planning; from neural circuitry to modular brain organization (Wikipedia 2011). Much of the empirical framework of cognitivism was retained even though a new paradigm had begun. Cognitive theories look beyond behaviour to explain brain-based learning. Cognitivists consider how human memory works to promote learning.

After memory theories like the Atkinson-Shiffrin memory model and Baddeley’s working memory model were established as a theoretical framework in Cognitive Psychology, new cognitive frameworks of learning began to emerge during the 1970s, 80s and 90s. It is important to note that Computer Science and

Information Technology have had a major influence on Cognitive Science theory. The cognitive concepts of working memory (formerly known as short-term memory and long-term memory) have been facilitated by research and technology from the field of Computer Science. Another major influence in the field of Cognitive Science is Noam Chomsky. Today, researchers are concentrating on topics like Cognitive Load and Information Processing Theory. This is beyond the scope of this chapter.

Constructivism

Constructivism is a learning theory or educational philosophy that many educators began to consider in the 1990s. One of the primary tenets of this philosophy is that learners construct their own meaning from new information as they interact with reality or other people with different perspectives. Constructivist learning environments require students to utilize their prior knowledge and experiences to formulate new, related, and/or adaptive concepts in learning. Under this framework, the role of the teacher becomes that of a facilitator, providing guidance so that learners can construct their own knowledge. Constructivist educators must make sure that the prior learning experiences are appropriate and related to the concepts being taught. According to Jonassen (1997), ‘well-structured’ learning environments are useful for novice learners and ‘ill-structured’ environments are only useful for more advanced learners. Educators utilizing technology when teaching with a constructivist perspective would be expected to choose technologies that reinforce prior learning perhaps in a problem-solving environment.

Connectivism

Connectivism is ‘a learning theory for the digital age’, and has been developed by George Siemens and Stephen Downes based on their analysis of the limitations of behaviourism, cognitivism and constructivism to explain the effect technology has had on how we live, how we communicate and how we learn. Donald G. Perrin, Executive Editor of the *International Journal of Instructional Technology and Distance Learning* says the theory ‘combines relevant elements of many learning theories, social structures, and technology to create a powerful theoretical construct for learning in the digital age’ (Wikipedia 2009b).

Different Types of Technology and their Educational Applications

Many different types of technology can be used for pedagogical integration of technology into science, technical and vocational education. Instructional materials include more conventional materials, such as the chalkboard, televisions, VCRs, overhead projectors, slide projectors and opaque projectors, as well as newer materials, such as the computer, various software applications, LCD projectors,

camcorders, digital cameras, scanners, the internet, satellite, interactive TV, audio and video conferencing, artificial intelligence, and so on.

Also, everything from video content and digital movie-making to laptop computing and handheld technologies have been used in classrooms, and new uses of technology such as podcasting, e-learning, internet are constantly emerging. Various technologies deliver different kinds of content and serve different purposes in the classroom. For example, technologies range from simple tool-based applications (such as word processors) to online repositories of scientific data and primary historical documents, to hand-held computers, closed-circuit television channels, and two-way distance learning classrooms.

Having a computer in the classroom is an asset to any teacher. With a computer in the classroom, teachers are able to manage the classroom affairs, demonstrate a new lesson, present new materials, illustrate how to use new programmes, and show new websites. Class website is a very effective way to display students' work. Once a web page is designed, teachers can post homework/assignments, students' work, famous quotes, trivia games, and much more. In this digital age, students know how to use the computer and navigate their ways through websites. The following are some other benefits of technology applications in the classroom. Technology:

- leads to enhancing a knowledge-level educational system;
- promotes higher-level thinking, independent learning, and life-long learning;
- improves education over what it would be without technology;
- enables easy access to course materials; instructors can post the course material or important information on a course website, which means that students can study at a time and location they prefer and can obtain the study material very quickly;
- improves student writing; it is convenient for students to edit their written work on word processors, which in turn improves the quality of their writing;
- enhances learning; different types of educational software are designed and developed to help students to learn specific subjects (e.g. pre-school software, computer simulators and graphics software).

Integrating into Education (Teaching and Learning)

With the advent of new technologies, a technology gap is increasing between teachers and students. To help bridge this gap, both students and teachers need to become competent in all that technology has provided for modern methods of teaching. In order to integrate technology effectively in teaching and learning, teachers must be capable of the following:

- designing and creating various instructional materials for learners;
- understanding design principles – how to create instructionally effective materials;
- understanding the types of materials to create to best meet-the-learner needs, and how they can utilize these materials in their teaching;
- understanding how to create materials from bulletin boards and transparencies to PowerPoint, Hyper Studio, and web-based materials;
- keeping up with emerging instructional materials and tools that are being developed and how these new materials might be useful to them as teachers.

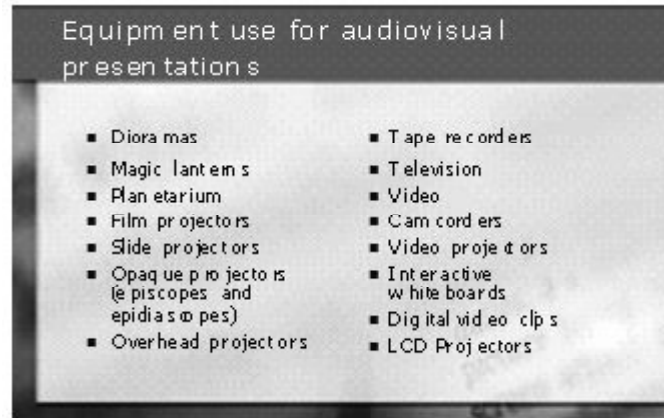
Development and Utilization of Instructional Materials

Whereas traditional learning tools include chalkboards or whiteboards, pencils, typewriters, and books, twenty-first century learning tools include traditional learning tools plus computers with high-speed internet, high-end graphics and instantly published audio and video tools. Modern methods of teaching make greater demands for the use of emerging instructional materials on the part of the teachers who are supposed to help the learners to understand certain concepts. A teacher's ability to produce and utilize equipment and materials for teaching and learning will depend, to a great extent, on his interaction with and continuous use of media for learning. Whenever such materials and equipment are used for teaching and learning, they are referred to as educational media. Educational media are a broad range of information-carrying resources that constitute an integral component of classroom teaching and learning, and are utilized in an instructional process, with the hope of facilitating effective and efficient communication in the teaching and learning process.

Educational media are classified into different groups by different people. Generally, educational media are categorized as audio media, visual media and audio-visual media.

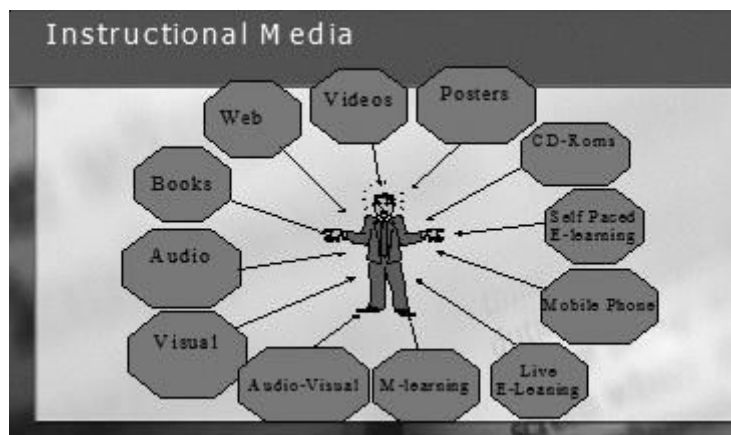
- Audio Media are teaching and learning devices that mostly appeal to the sense of hearing. They include telephone, records, public address system, tape recorder, talking drum and human voice;
- Visual Media are teaching and learning devices that mostly appeal to the sense of seeing only. They can be sub-categorized into projected and non-projected visuals. The projected visual requires electricity for projection, e.g. films, slides and transparencies. The non-projected ones do not need a light source. These include pictures, maps, globes, posters, realia, etc;
- Audio-Visual Media refers to those instructional materials which provide the students with the opportunity of seeing and hearing at the same time, e.g. instructional or education television, closed-circuit television, microcomputer (see the figures below).

Figure 13.1: Some Equipment Used for Audio-visual Presentations



Source: Clark (2000)

Figure 13.2: Some Instructional Media



Source: Clark (2000)

Functions of Instructional Media

There are several functions of instructional media. The most important functions are listed below:

- helps in focusing attention and motivating learners;
- lends support and authenticity to what the teacher says;
- makes learning real and concrete;
- makes individualization of instruction possible; and
- increases learning effectiveness.

Emerging Educational Media and their Applications

There is a proliferation of emerging educational tools such as E-Readers, mobile applications, nook and tablets. They are among a few of the latest communication learning devices used currently along with virtual and online training. These recent devices are used to locate resources to educate large numbers of students simultaneously, internationally. Snapshots of some of the common and emerging technologies are presented below.

Internet

The development of the internet has started a revolution in teaching and learning that is providing a new opportunity for delivering instruction through various media. Such a new revolution has been called several names – web-based learning, online instruction, virtual learning or e-learning. Recently, new terminologies such as m-learning, i-learning, u-learning, and new media have come on board. Regardless of the name given to it, this form of learning integrates online educational telecommuting activities into teaching and learning.

Mobile Learning

Mobile learning, or m-Learning, has different meanings for different communities. Although related to e-learning and distance education, it is distinct in its focus on learning across contexts and learning with mobile devices. One definition of mobile learning is: Any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies. In other words, mobile learning decreases the limitation of learning location with the mobility of general portable devices. The term covers: learning with portable technologies, where the focus is on the technology (which could be in a fixed location, such as a classroom); learning across contexts, where the focus is on the mobility of the learner, interacting with portable or fixed technology; and learning

in a mobile society, with a focus on how society and its institutions can accommodate and support the learning of an increasingly mobile population that is not satisfied with existing learning methodologies.

Some major ways to integrate communication devices into science are through: voice, short message service (SMS), internet, data transfer, and mobile instant messaging (MIM).

- *Voice* – The mobile phone allows a user to communicate with another user especially when students are in the field collecting data or at a construction site.
- *Short message service (SMS)* – This service allows individuals to send short messages, with a maximum of 160 characters, to other individuals or groups. It becomes applicable where students need to communicate in an environment where they cannot make noise.
- *Data Transfer* – Bluetooth is a technology that enables people to share data, such as music, videos and images wirelessly via their mobile phones, among other devices (Erasala and Yen 2002). It becomes important for sharing of information from students to their lecturers and from the lecturers to the students.
- *Mobile instant messaging (MIM)* – A large number of people prefer instant messaging (IM) to other electronic communication methods, such as e-mail (Marshall 2003). One of the attractive aspects of IM is the instantaneous transfer of messages between individuals and groups.

E-learning

E-learning (or sometimes Electronic Learning or eLearning) is a term which is commonly used, but does not have a common definition. Most frequently, it seems to be used for web-based distance education, with no face-to-face interaction. However, much broader definitions are also common. For example, it may include all types of technology-enhanced learning (TEL), where technology is used to support the learning process. Although pedagogy is usually not part of the definition, some authors do include it; for example, one of the definitions says e-learning is 'pedagogy empowered by digital technology'. It is important to mention that the term 'e-learning' is ambiguous. It is nearly impossible to define what it is, as it has different meanings to different people. Furthermore, it is often used interchangeably with various other related terms, such as distance learning, distributed learning, and electronic learning. The meaning of the term also seems to be dependent on the context in which it is used. In companies, it often refers to the strategies that use the company network to deliver training courses to employees. Lately in most universities, e-learning has been used to define a specific mode to attend a course or programme of study where the students rarely or never meet face-to-face, nor access on-campus educational facilities, because they study online.

Social Networking

A social network service focuses on building online communities of people who share interests and/or activities, or who like to explore the interests and activities of others. Most social network services are web-based and provide varieties of ways for users to interact, such as e-mailing and chatting. Social networking has provided new ways to communicate, share information, teach and learn. Social networking websites are being used regularly by millions of people around the world (Wikipedia 2009a). Abbitt (2007) states that there has been ‘tremendous growth in the popularity of websites focusing on social activities and collaboration’; this would include online applications such as Facebook.

The main types of social networking services are those which contain category divisions (such as former school-year or classmates), means to connect with friends (usually with self-description pages) and a recommendation system linked to trust. Most popular social networks consist of Yahoo group, Facebook, MySpace, Twitter, LinkedIn, Nexopia, Bebo, Hi5, dol2day, Tagged, Xing, Orkut, Friendster, Multiply, Wretch, Xiaonei, Cyworld, Skyrock, etc. This list increases daily, but they all have one thing in common, and that is ‘networking’.

Tertiary institutions are beginning to recognize the use of social networking tools to support teaching and learning. They are now realizing that these same tools can be used to create pedagogically sound learning environments for students. Academics have also examined the building of online communities that have dealt with different aspects of online community development in classroom environments. For instance, Abbitt (2007) used a Coldfusion system to allow students to add resources and have these rated by their peers. Roper (2008) utilized an asynchronous online discussion tool to allow students to participate in an online undergraduate labour/management relations’ class while McElrath and McDowell (2008) examined Brown’s theory of community building in their online distance education course. Although social networking tools are not designed for explicit learning targeted at education; nonetheless, they are tools that people use to organize information and understand the world and to learn. Educators and trainers should take advantage of the widespread availability of these tools – at no cost – to support teaching and learning.

Communication technologies are also categorized as asynchronous or synchronous. Asynchronous activities use technologies such as blogs, wikis and discussion boards. The idea here is that participants may engage in the exchange of ideas or information without the dependence of other participants’ involvement at the same time. Electronic mail (Email) is also asynchronous in that mail can be sent or received without having both the participants’ involvement at the same time. Synchronous activities, on the other hand, involve the exchange of ideas and information with one or more participants during the same period of time. A face-to-face discussion is an example of synchronous communication.

Synchronous activities occur with all participants joining in at once (e.g. online chat session or a virtual classroom or meeting). Within synchronous learning; learning and teaching take place in real time (same time) although the trainer and learners are physically separated from each other (place shift). Examples include:

- listening to a live radio broadcast or watching live a television broadcast;
- audio/video conferencing, internet telephony, online lectures, two-way live satellite broadcast.

One major characteristic of asynchronous learning is the fact that that the trainer prepares the courseware material before the course takes place and the learner is free to decide when he wants to study the courseware.

Examples include:

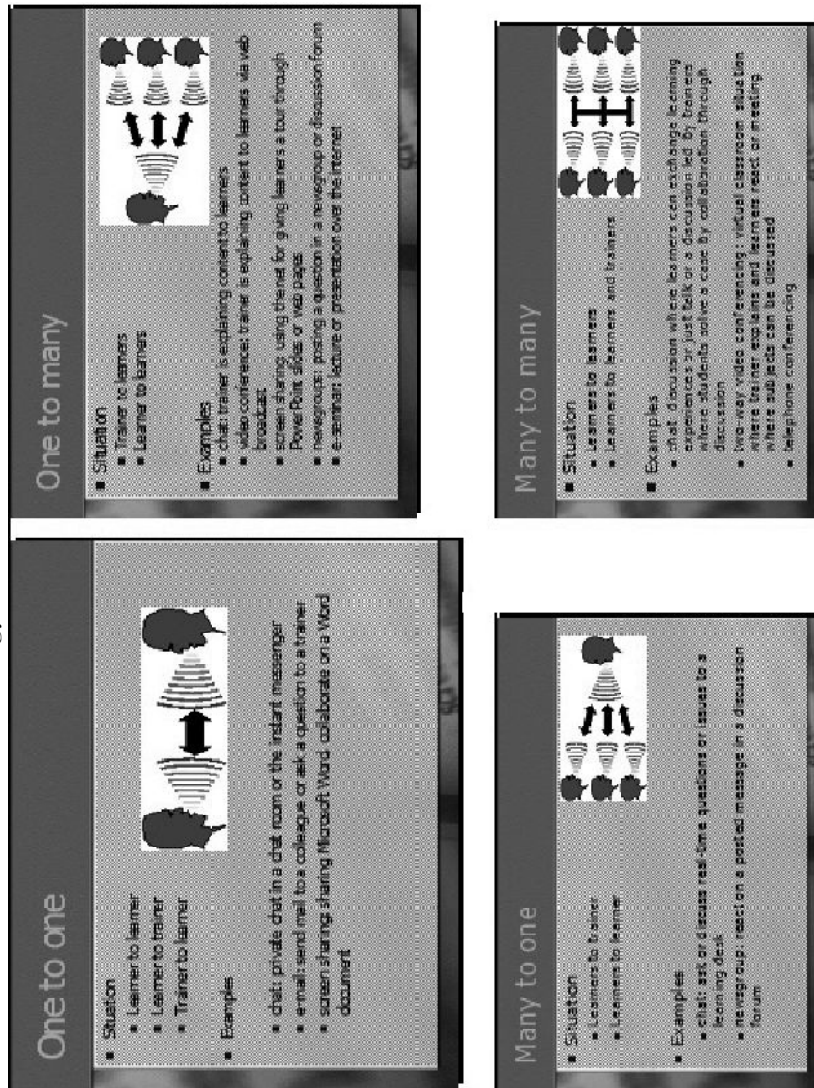
- self-paced courses taken via Internet or CD-Rom and videotaped classes;
- stored audio/video Web presentations or seminars, recorded audio tapes; and
- question and answer mentoring and e-mail messages.

Information and Communication Technologies

Although the use of information and communication technologies (ICT) is often limited to computer literacy and information retrieval by pupils and teachers, their effective pedagogical integration remains marginal. Information and communication technologies (ICT) is an umbrella term that covers all advanced technologies in manipulating and communicating information. The common usage of ICT is synonymous with the fact that IT or ICT encompasses all mediums of recording information (magnetic disk/tape, optical disks (CD/DVD), flash memory, etc. and, arguably, also paper records); technology for broadcasting information – radio, television; and technology for communicating through voice and sound or images – microphone, camera, loudspeaker, telephone and cellular phones. It includes the wide varieties of computing hardware (PCs, servers, mainframes and networked storage).

It has developed a personal hardware market that comprises mobile phones, personal devices, (MP3, MP4, MP5 and MP6) players, laptops, palmtops, etc. The full gamut of application software spans from the smallest home-developed spreadsheet to the largest enterprise packages and online software services. Similarly, the hardware and software needed to operate networks for transmission of information, again ranging from a home network to the largest global private networks operated by major commercial enterprises and, of course, the internet. 'ICT' makes technologies such as broadcasting and wireless mobile telecommunications more explicit. We distinguish different directions/ways to communicate:

Figure 13.3: Communication with Technology



Source: Clark (2000)

Graphics adapted from: Martin Molhanec (www.teipat.gr/socrates-ip2006/files/e-Learning.ppt).

Integrating Technology into Science

Without any doubt, science education has benefited most from technology. This can be proved by looking at many inventions and other activities – from the massive amount of interactive applications to technologies like probeware. Students have an even better chance than others to be involved with real science that engages them in scientific methods and the thrill of discovery.

The internet alone has been a transformative technology. There are varieties of resources that both teachers and students can take advantage of on the internet – from interactive activities to collaborative projects that connect classrooms around the world in scientific investigations. Timely content and information like weather satellites and astronomical photography have made it a simple process to have the same access to information as professional meteorologists and astronomers. Interactive applications have provided students with interactive activities to test and expand their knowledge of scientific principles, graphics to increase the motivation of users to attend prompt perception, aid recall and assist in the development of higher order thinking and concept formation and simulations to explain processes that are difficult to ‘see’ in static form. All these are possible with the aid of technology. The following websites (Knowledge Network Explorer 2004) consist of some examples of what has been done in the integration of technology into science. All the websites contain teacher resources, lesson plans, and activities for the students.

Froguts

<http://www.froguts.com>

It is a website where students can access gaming media, pathology and histology equipment, It can simplify laboratory activities and empower students with dynamic experiments.

DNA Interactive

<http://www.dnai.org>

It is a website where students can register free to join an online teaching community and create personalized web pages and use the Lesson Builder tool. The website also has an animated primer of 75 experiments that made modern genetics. The science behind each concept is explained by: animation, image gallery, video interviews, problem, biographies, and various links.

Genetic Learning Center

<http://gslc.genetics.utah.edu>

This centre is a science and health education programme located in the midst of the bioscience research at the University of Utah. Its mission is to make science easy for everyone to understand. It provides educational materials and programmes for global and local audiences.

HHMI Biointeractive

<http://www.biointeractive.org>

This website presents issues such as where and when did humans arise and what distinguishes humans from other species.

Visual Interpretation of the Periodic Table

<http://www.chemsoc.org/viselements/index.htm>

This website provides information on a natural affinity between iconography and chemistry.

Web-based Inquiry Science Environment (WISE)

<http://wise.berkeley.edu>

WISE is a simple, yet powerful learning environment where students examine real world evidence and analyze current scientific controversies.

Collaborative Projects

Students can collaborate with other students across the world through the Internet. In fact, creating a realistic, collaborative environment is the best way for students to experience the real world life of a scientist. Some of the websites below provide students some resources with information on collaborative connections with scientists and enable students to participate. There are many examples, but the one listed below is the one we visited at the time of our review of literature.

Voyage of the Odyssey

<http://www.pbs.org/odyssey>

The Voyage of the Odyssey is a five-year programme designed to gather the first ever baseline data on levels of synthetic contaminants throughout the world's oceans. It is dedicated to rigorous scientific research in conjunction with global education in order to improve people's appreciation for, and understanding of, the ocean environment and the creatures within it, and to contribute to the conservation of whales. The materials posted are advanced multimedia material offering a thematic, hands-on approach to understanding life in the seas.

Ask a Scientist

<http://www.askascientist.org>

Ask a Scientist connects one to some of the top scientists in the world, and each of them is connected to the Howard Hughes Medical Institute. This is a place one can ask questions about medicine, human biology, animals, biochemistry, microbiology, genetics or evolution.

NASA Quest

<http://quest.arc.nasa.gov>

NASA Quest Challenges are free web-based, interactive explorations designed to engage students in authentic scientific and engineering processes.

There are some websites that act as the home of several content databases that go beyond what students generally have access to in the traditional curriculum resources. Many of these contain not only text, but images and animations that provide opportunities for students to reinforce and extend their scientific knowledge. These include:

Planetary Photojournal

<http://photojournal.jpl.nasa.gov/>

Science World

<http://scienceworld.wolfram.com/>

Brainpop: Science

<http://www.brainpop.com/science/seeall.weml>

Biodiversity Hotspots

<http://www.biodiversityhotspots.org>

Also, the internet has also been the largest library of this age. Finding the best resources for each area of the content that teachers must teach to students can take a long time if one does not use existing resource directories. The best directories subdivide the resources into each content area, making it even easier to locate specific resources.

SCORE Science

<http://scorescience.humboldt.k12.ca.us/>

Blue Web'n: Science

<http://www.kn.sbc.com/wired/bluwebn/contentarea.cfm?cid=11>

ENC Online

<http://www.enc.org>

Frank Potter's Science Gems

<http://www.sciencegems.com>

Integrating Technology into Education

Integrating technology is what comes next after making the technology available and accessible. It is a goal-in-process, not an end state. The goal of perfect technology integration is inherently unreachable: technologies change and develop, students and teachers come and go – ‘things change. It is the process by which people and their institutional setting adapt to the technology that matters most. The process of technology integration is one of continuous change, learning, and (hopefully) improvement. Developing a culture that embraces technology is also important to its successful integration. For example, sending important messages

by e-mail, or encouraging staff to use electronic calendars to schedule meetings, fosters a culture that accepts technology as 'natural' to the business of everyday work.

Conclusion

This chapter has submitted that pedagogical approaches to using new technologies in education are being consolidated through the integration of ICT into science, vocational and technical subjects. The extent of sustainability, further development and dissemination of practice highlighted in the chapter indicates that the sustainability levels of investment in school ICT provision may be paying off. However, teachers and subject departments depend on adequate access to reliable resources (and technical support) if practice is to evolve. A favourable management outlook and development of ICT, as a school priority, in turn leads to soliciting further resources and expanding practice. Thus, the process is complex and iterative rather than linear. Individual teachers' confidence, skills and motivation towards using ICT develop in response to other contextual factors, including a supportive organizational culture. These 'internal' factors also play a critical role in the processes of both developing and disseminating new practice.

In terms of actual instruction, technology is an invaluable tool for providing active collaborative learning and assessment. While basic word-processing programmes allow students to become independent publishers of ideas and opinions, email provides opportunities for 'peer review' and group editing. More sophisticated interactive multimedia packages offer true inquiry-based learning, where students must construct and demonstrate solutions to a variety of in-class projects. This is not to suggest that technologies are used in reform to replace the role of the teacher; realistically, that would be both undesirable and impractical. Instead, the computer must be recognized as an effective teaching tool which assists the instructor or teacher. Software offer students individualized learning; while some students progress on a subject at their own pace, those who begin to fall behind can receive proper interpersonal attention from the instructor. The computer allows the teacher to concentrate on interaction and individualized assistance. In a sense, because computers have proved to be a successful tool of reform-minded schools and educators, they are now inextricably linked to the reform movement itself.

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14

Teacher Education and Process Skills Enhancement in the Science Technology Society Classroom

Francis M. Isichei

Introduction

In this chapter, teacher education is considered from the perspective of science education which has always articulated the need to have students develop their thinking and reasoning skills. The processes that scientists use have been seen as essential to imparting learning in science courses. Over time, there have been a multitude of curriculum projects that have emphasized the process skills that scientists use for students to learn (Wilson and Livingston 1996). Thinking of teacher education in Africa in the digital age, there is a need to have some insight into some of these projects. According to Wilson and Livingston (1996:60), projects of the 1960s revisit and utilize the processes of science identified by scientists and incorporated into reform programmes of the 1960s. Most notable of these are the Benchmarks for Science Literacy: Project 2061 (AAAS 1993) and the National Science Education Standards (NCSESA 1993). The benchmarks describe these reforms as 'Habits of Mind' and 'The Nature of Science'. Although the reforms emphasize the processes of science, they neglect the same element that previous reforms have – the context for instructions. Specially, a context for learning that is relevant, seeks connections between concepts, shows science as a way of thinking, and works from the current conceptual understanding of students. One instructional movement is filling the void context while stressing the importance of the processes in sciences. The Science Technology Society (STS) instructional movement provides a context for the use of process skills used in science. The differences of the context between traditional process instruction and the STS process instruction have been contrasted by Yager and Roy (1993). It shows

evidence in the student as learner, instead of receiver of science, in a context where there is an emphasis on process skills that students use as they resolve their own problems.

Science/Technology/Society (STS) is widely recognized as a major reform effort as correctives are sought around the globe to attain scientific literacy for all. The known school science is ineffective in producing students who are knowledgeable of the basic laws and theories known to scientists as accepted views of the workings of nature, nor are schools successful in producing students who think that such views of the universe are important and/or relevant to their own lives. Interestingly, technology, digital technology inclusive (how the human-made world operates), is seen as more important in contemporary time than science (how the natural world operates). And yet, it is rarely taught to all students across the elementary secondary school years. Science/Technology/Society has been called the current megatrend in science education (Roy 1984). Others have described it as a paradigm shift for the field of science education (Hart and Robottom 1990). It is the thinking; therefore, that process skills enhancement in the STS classroom with other skills such as critical thinking, education for critical thinking and action research in teacher education would be worthwhile in the digital age in the African educational system.

Process Skills and STS

Process skills and STS in the classroom enable students to learn science as against the traditional process where students receive science. Process skills with STS give prominence to context in which there is emphasis on process skills that students use as they resolve their own perceived problems in science courses. The comparisons given by Yager and Roy (1993) on traditional and process skills illustrate the difference. In the traditional process, science for students are skills scientists process; while in STS, science processes are skills students themselves can use. In the traditional settings, students see science processes as something to practice as a course requirement; but in STS, students see science processes as skills they need to refine and develop themselves more fully. In the traditional processes, teachers emphasize process skills that are not understood by students because these skills rarely contribute to actions in or even outside the course; while in STS, students readily see the relationship of science processes to their own actions. In the traditional process, students perceive science processes as abstract, glorified, unattainable skills; but in STS, students perceive science processes as a vital part of what they do in the science class. The argument is that, in previous reform initiatives, process science has been emphasized, but lacked the acknowledgment of the context for instruction. The students participated in the processes found in science, yet they had no bridge to other science or real-life experiences; but STS addresses the context in a meaningful way that sets the agenda for other instructional programmes.

It is obvious from African educational perspectives, as evident from the level of scientific and technological stance, that most secondary school students lack the intellectual skills in science and technology that would enable them to assume their roles in society, and that students need to cultivate scientific pattern of thinking, logical reasoning, curiosity, openness to new ideas, and skepticism in the evaluation of claims and arguments. One is left to conclude that students need to utilize the process skills characterizing science in order to understand and produce their own knowledge, which will ultimately allow them to participate actively in society. This is especially critical when contemporary life is bombarded daily with issues and problems based on science and technology. The ability to use the processes learned in science classes should provide students with a mechanism to evaluate, contemplate, and react to the changing world of today. In the STS process, we recognize that as science teachers attempt to conduct science, they are faced with decisions and considerations in using the processes characterizing science. These are decisions and considerations that are tied to the 'connectedness' of science process skills; which allow the processes connect to one another, the learner and the future problems, issues or investigators. Thus, the 'connectedness' should be addressed in a way that is developmentally appropriate, meaningful and relevant to the learners. In doing this, science educators become guides or facilitators of instruction. This entails monitoring students as they proceed through a problem, issue or investigation, providing information at critical moments and asking questions that bring about reflection on specific processes. This set up in science education may appear simplistic at first but the problem has a great deal of inherent complexity. Science educators could not possibly address all three levels of process connection in their instruction, unless instruction is centred round the student (Hurd 1991; Wilson and Livingston 1996).

By using the student as the template for classroom instruction, science processes are integrated through their actions. The teacher does not have to explain to each student which processes they are experiencing. As students proceed through an investigation, they select and use the processes they need. The nature of investigation blurs divisions of basic and integrated process skills. Basic process skills such as observing, classifying, communicating, measuring, using space/time relations, using numbers, and inferring and predicting, are used in conjunction with the integrated skills of controlling variables, interpreting data, formulating hypotheses, defining operationally, and experimenting. Furthermore, using process skills in a combined state supports the development of thinking skills, an initial tenet of using process skills. Baird and Borich (1987) and Padilla, Okey and Dillashaw (1983) have suggested that these skills are often viewed independently, yet they have been observed as correlating to one another and with Piaget's construct of formal reasoning. From this perspective, it is imperative that science educators in Africa bridge both the basic and integrated process skills into a student's repertoire of

critical thinking which has been for a long time the concern of science educators generally. The final test of successful incorporation of a student would be the transfer of the skills to new and novel situations. Studies suggest that the longer the instructional periods of using the processes found in science, the greater the gains in the students' use of these process skills (Finley, Lawrenz and Heller 1992; Padilla, Okey and Garrard 1984). Specially, Padilla, Okey, and Garrard (1984) found that students who used integrated process skills for an extended duration of time showed growth in identifying variables and stating hypothesis. Roth and Roychoudhury (1993) found that authentic contexts supported the use of the process skills used in science. Thus, both duration and context play a role in the students' acquisition of basic and integrated science processes.

It is important to note that once these processes are 'incorporated', students will hopefully resort to them when they are faced with problems or investigations. Perkins and Salomon (1980) refer to transfer in problem solving as being a high or low road to transfer. The 'low road' depends on previous experience and similarity to previously practiced problems. The 'high road' depends on the learner's ability to abstract the problem. The learner must reflect and retrieve previous information and apply it to the new situation. Ultimately, the degree of transfer of process skills to new or novel situations may be dependent on previous experiences. When STS offers 'connectedness' to the process skills scientists engage in, students select problems, issues or investigations that are meaningful and relevant. It is hoped that as students engage in these investigations, they experience both basic and integrated process skills and assimilate and refine their repertoire of the skills found in science. The understanding is that, with the prolonged involvement of multiple STS opportunities, students create avenues of transfer to new situations. These three areas provide the 'connectedness' that is found in the science that Hurd (1991) promotes. African science educators must be aware that science is not an accumulation of knowledge about a particular domain, but competence in the use of process skills that are basic to all science (Roberts 1982). In this way, students who are involved in an STS problem, issue or investigation see the processes as a way of knowing and practicing science. In the broader scheme, students are provided with the skills to evaluate, contemplate and react to their world.

STS advocates find that the goals and instruction characterizing STS are congruent with the needs of the student. Students pursue investigations based on their own knowledge, cognitive, and interest level. Students work with current questions, problems and issues that are important, relevant and stated by them. As students act on these investigations in a manner that they select to follow, they utilize the processes that are found in science. This context allows students to become internally motivated to use the processes found in science, reflective about the need of science processes, and refine the processes that have been and

will be used. African science teachers must be aware that successful practices for students require a positive affective domain within the instructional context. STS has been found to have a positive effect on students' attitudes toward science (McComas 1993). The implication for this is far-reaching when it comes to science instruction. STS provides a way to combat the negative feeling that students have had about science over the years (Jones Mullins, Raizen, Weiss and Weston 1992). An increase in the affective domain suggests that students find personal satisfaction in their participation in science. Students who enjoy and like science are more likely to engage in science (Simpson and Oliver 1990).

Research studies have confirmed that student involvements with STS strategies are superior to typical textbook/laboratory instruction in stimulating growth in science process skills (Iskandar 1991; Liu 1992; Mackinnu 1991). African science educators must appreciate that, in the past studies, students across all grades who have been involved in STS gained a further understanding of all basic science process skills. An evaluation of process skills can occur at the level of classroom or individual student skill within the class group. For example, Liu (1992) looked at fifteen teachers using both the STS approach and the traditional approach. Teachers who implemented the STS approach stimulated a significant difference ($P < 0.05$) in student mastery of science process skills. Every STS classroom was significantly different in the obtainment of science process skills. Iskandar (1991) looked at the percentages of specific science processes that were demonstrated by students of seventeen teachers who conducted both STS and non-STS classes. She found that the differences in the mastery of science process skills were significantly different ($P < 0.01$) in favour of the STS approach. STS classrooms typically had process use that was twice what traditional classrooms had. Both studies used the Process Instrument from *Iowa Assessment Handbook* (Tamir, Yager, Kellerman and Blunck 1991). These studies support the idea that STS classrooms provide opportunities for students to refine and evolve the processes found in science. Students had a greater mastery and utilization of process skills in these classrooms as opposed to classrooms where traditional instructional methods were used. Furthermore, there were no demonstrated differences in the acquisition of processes between male and female (Wilson and Livingston 1996). STS process skills in science had its initiatives in United States, Britain, Netherlands, Japan, Australia and developing countries in the Pacific.

Education for Critical Thinking

Process skills and STS as knowledge and experience applied to practice call for judgement and judgement is rooted in critical thinking in all spheres of endeavour. According to Lipman (2007), wherever knowledge and experience are not merely possessed but applied to practice, we are likely to see clear instances of judgement. Architects, lawyers and doctors are professionals whose work constantly involves

the making of judgements. The same is true of composers, painters and poets. This is also true of teachers, farmers and theoretical physicists as well; all of them have to make judgements as part of the practice of their occupations and their lives. We, as rational beings, because we make moral judgements when we are in moral situations. These are practical, productive and theoretical, as the philosopher would have put it. Insofar as we consistently make such judgements well, we can be said to behave wisely.

Good professional science teachers make good judgements about their own practice as well as about the subject matter of their practice. A good science teacher not only teaches well but also makes good judgements that provide a mechanism for the meaningful integration of the students with science concepts that enables them to develop a 'way of knowing' and a 'desire to know'. A judgement, then, is a determination of thinking, of speech, of action or of creation. These are likely to be good judgement if they are products of skillfully performed acts guided or facilitated by appropriate instruments and procedures.

Critical thinking – the result of education – is applied thinking. Therefore, it is not just process; it seeks to develop a product. This involves more than attaining understanding. It means producing something. It involves using knowledge to bring about reasonable change. Minimally, the product is a judgement and maximally it is putting that judgement into practice. There is another sense in which critical thinking needed in science teacher education in Africa would develop a product. It is the critical thinking which involves all responsible interpretation (the production of meaning) and in all responsible translation (the preservation of meaning). Critical thinking is thinking that facilitates judgements because it relies on criteria, is self-correcting and is sensitive to context (Lipman 2007: 427-8).

Critical Thinking Relies on Criteria

There seems to be an association between 'critical' and 'criteria' because they resemble each other and have a common ancestry. In the line of resemblance, we are familiar with book, music, poetry and film critics; and it is not uncommon to assume that those among them whose criticism is considered excellent are those who apply reliable criteria and therefore could be said to be critical. We are also aware of a relationship between criteria and judgements, for a criterion is often defined as 'a rule or principle utilized in the making of judgements' (Lipman 2007). It seems reasonable to conclude, therefore, that there is some logical connection between critical thinking and criteria and judgement. The connection, of course, is to be found in the fact that critical thinking is reliable thinking, and skills themselves cannot be defined without criteria by means of which allegedly skillful performances can be evaluated. So, critical thinking is reliable thinking that both employs criteria and can be assessed by appeal to criteria. For education in general, and science education in particular, it would not be out of the way to

consider what uncritical thinking might be. Surely, uncritical thinking suggests thinking that is flabby, amorphous, arbitrary, specious, haphazard and unstructured (Lipman 2007). The fact that critical thinking can rely upon criteria suggests that it is well-founded, structured, reliable, defensible and convincing. How would this happen in an education system that appeals to critical thinking? As educators, whenever we make a knowledge claim or utter an opinion, we are vulnerable unless we can somehow back it up. In order to back up our knowledge claim or opinion, we are led to discover the connection between reason and criteria. Criteria are reasons; they are one kind of reason, a particularly reliable kind. When we are faced, as educators, to sort things out that are descriptive or evaluative – and these are two very different tasks – we have to use the most reliable reasons we can find, and these are classificatory and evaluative criteria. Criteria may or may not have a high level of public acceptance, but they have a high level of acceptance and respect in the community of expert inquirers. As teachers, the competent use of such respected reasons is a way of establishing the objectivity of our prescriptive, descriptive and evaluative judgements. Thus, architects will judge a building by employing such criteria as utility, safety and beauty; magistrates make judgements with the aid of such criteria as legality and illegality; educators use purposes, goals, aims, objectives, intuitions, insights, experimental findings, methods, etc., while critical thinkers rely on such time-tested criteria as validity, evidential warrant and consistency. Any area of practice – like the examples given above of architectural practice, judicial practice, teaching profession and cognitive practice – should be able to cite the criteria by which that practice or profession is guided. The intellectual rational domiciles we inhabit are often of flimsy construction; we can strengthen them by learning to reason more logically. But this will help little if the grounds and foundations upon which they rest are spongy. We need to rest our claims and opinions, as well as the rest of our thinking, upon a footing as firm as possible (Lipman 2007).

Critical Thinking is Self-corrective

There is an assumption that much human thinking moves along uncritically; that is, that human thought unrolls impressionistically, from association to association, with no concern for either truth or validity and with even less concern for the possibility that it might be erroneous. Among the many things we reflect upon is our own thinking. We can think about our own thinking, but we can do so in a way that is still quite uncritical. And so, granted that ‘meta-cognition’ is ‘thinking about thinking’, it needs not be equivalent to critical thinking. When Peirce (1931) discussed the connection between self-correcting inquiry, self-criticism and self-control as the most characteristic feature of inquiry that aims to discover its own weaknesses and rectify what is at fault in its own procedures – inquiry, then, is self-correcting. One of the most important advantages of converting the classroom into a community of inquiry with intellectual and moral integrity is that

members of the community begin correcting each other's methods and procedures. The result is that insofar as each participant is able to internalize the methodology of the community as a whole, each is able to become self-correcting in his or her own thinking.

Critical Thinking and Context

We appreciate better critical thinking, displaying sensitivity to context when we consider an astute copyeditor going over an essay prior to publication, who makes innumerable corrections justifiable by appeals to recognized rules of grammar and spelling. To him or her, idiosyncratic spellings are rejected in favour of uniformity, as are grammatical irregularities. But stylistic idiosyncrasies on the author's part may be treated with considerably greater tolerance and sensitivity. This is because the editor knows that the style is not a matter of writing mechanics; it has to do with the context of what is being written as well as with the person of the author. It is therefore important to recognize thinking that is sensitive to context to involve: a) exceptional or irregular circumstances; b) special limitations, contingencies or constraints wherein normally acceptable reasoning might find itself prohibited; c) overall configurations; d) the possibility that evidence is atypical; and e) the possibility that some meanings do not translate from one context or domain to another.

Action Research and Teacher Education

The appeal for process skills and STS in science teacher education can be realized in an educational system only if action research is integrated into teacher education in Africa as elsewhere on the globe. Research is a cognitive act, as it teaches us to think at a higher level in the knowledge-based community. From this perspective, we can appropriate the action research movement in teaching to further our critical postmodernism vision of school reform and serve as a pedagogical strategy to help teachers break out of the prison of modernist thinking. Experience has shown that critical action researchers equipped with an understanding of research methodologies truly operate on their own recognizance, as they stake their claim to independence from the oppressive regime of educational leadership. According to Kincheloe (1993), action research that is critical meets five requirements: (a) it rejects positivistic notions of rationality, objectivity and truth – critical action research assumes that methods and issues of research are always political in character; (b) critical action researchers are aware of their own value commitments, the value commitments of others, and the values promoted by the dominant culture. In other words, one of the main concerns of critical action research involves the exposure of the relationship between personal values and practice; (c) critical action researchers are aware of the social construction of professional consciousness; (d) critical action researchers attempt to uncover those aspects of

the dominant social order that undermine our effort to pursue emancipatory goals; (e) critical action research is always conceived in relation to practice – it exists to improve practice.

With these requirements in mind, critical action research is a consummate democratic act, as it enables teachers to determine the conditions of their own work. Critical action research facilitates the attempt of teachers to organize themselves into communities of researchers dedicated to emancipatory experiences for themselves and their students. When teachers unite with students and community members in an attempt to ask serious questions about what is taught, how it is taught and what should constitute the goals of a school, not only is critical self-reflection promoted, but group decision-making also becomes a reality (Carr and Kemmis 1986:221-23; Giroux and Aronowitz 1985:81). As action research fights techno-teaching and procedural thinking, it seeks unity with critical democratic groups outside the school. Using their research skills to identify subjugated knowledge in the local community, teachers as researchers become cultural workers who develop unique post-formal pockets of people who come to think about cognition as a political activity. Educational reform of any type will not work unless teachers are empowered. Action research is an empty idea; it becomes another educational triviality unless teachers make it a part of their lives and their belief systems. This explains why top-down educational reforms fail – critical reform cannot be mandated without teachers' consent. Any kind of reform predicated on a view of teachers as de-skilled functionaries who carry out the orders of the superiors cannot succeed. In a dominant culture that has not valued self-reflection on the part of its teacher professionals, action research becomes an oppositional activity as it pushes professionals in a variety of fields to reconsider their assumptions (Greene 1988). Information produced by post-modern inquiry is a self-conscious social text produced by a plethora of mutually informing contexts (McLaren 1992).

It is assumed that humans are active agents whose reflective self-analysis and knowledge of the world leads to action. Action research is the logical extension of critical theory in that it provides the apparatus for the human species to look at itself. Critical action that is aware of postmodern perspectives on the production of subjectivity, the context of hyper-reality, and post-Jaynesian connected consciousness can contribute to the socio-cognitive emancipation of men and women. Such a socio-cognitive emancipation is the first step in our cognitive resolution, our post-formal effort to see the world and ourselves from new civilization as Africans through our educational system. Based on a democratic dialogue, an awareness of historical moment, and a passionate commitment to the voice of the oppressed, the post-formal insurrection re-defines research, in the process producing knowledge between the crack information previously swept under the rug, particularly in the sciences.

Conclusion

The views of science as historically rooted and as an enterprise affected by society and culture have not influenced science education in Africa. Otherwise, how would anyone explain that in the twenty-first century world, no African country has been able to graduate from developing country to an emerging nation? This is the case despite the serious reform efforts by some of the African countries, since independence, to develop new curriculum materials and to provide corresponding teacher education. This reality of the situation of science education in Africa, even in this digital age, informed the suggestion for process skills and STS that have the potential for influencing science education since they focus on changing the goals and content of science teaching in ways that will link science to social concerns. It is hoped that through process skills enhancement in the STS classroom, critical thinking and action research in the African teacher education system, students would be equipped with meaningful integration of science concepts and develop a way of knowing, desire to know and practice science as art. Our approach would awaken a meaningful context that has students building their own knowledge base; create complex challenges that would have students using basic and integrated processes of science; lead to reflection about the consequences of procedural decisions, continuing development of higher-order thinking skills and opportunities for transfer of processes to new and novel situations.

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15

Obstacles to the Domestication of ICT in Humanities Education in Nigeria

Anthonia Maduekwe

Introduction

In today's competitive global economic environment, information and communication technology (ICT) is becoming a widely accepted tool for multi-faceted development. In view of the flexible services it offers, the new digital technology avails opportunities to revolutionize the traditional system of education. Concerns over educational relevance and quality co-exist with imperatives for expanding educational opportunities in higher education. To revamp the educational system, there is the need to produce a technologically literate workforce with positive disposition to technology use and reasonable competence of performing in a borderless knowledge-based economy. According to UNESCO (2002), cited in Owhotu (2006), ICT is a term used to describe the tools and the processes to access, retrieve, store, organize, manipulate, produce, present and exchange information by electronic and other automated means. These means include hardware, software and telecommunication in the form of personal computers, scanners, digital cameras, phones, faxes, modems, CD and DVD (digital view disc), players and records, digitalized video, radio and TV programmes and multimedia programmes.

ICT has been proved to be a very important aspect of the teaching and learning process. It plays a significant role in development efforts as they open up new opportunities for progress, the exchange of knowledge, education and training and for the promotion of creativity and intercultural dialogue. These technologies can also help to strengthen social cohesion and reinforce the capacity development for humanities education. Higham and Macaro (1993) conceptualize a broad outlook to gainful education that occurs through the medium of the

internet on both static and interactive websites. They indicate that some technology-related activities in humanities education include the use of:

- Broadcast;
- Micro-computer with appropriate keyboards and other devices to teach literacy and writing;
- Keyboards, effects and sequencers in music teaching;
- Devices to facilitate communication for students with special needs;
- Electronic toys to develop spatial awareness and psycho-motor control;
- E-mail to support collaborative writing and sharing of resources;
- Video-conferencing to support teaching of modern foreign languages;
- Internet-based research to support geographical inquiry;
- Integrated learning systems (ILS) to teach basic literacy;
- Communication technology to exchange administrative and assessment data.

The experience of introducing different types of ICT in humanities education classrooms and other educational settings all over the world over the past several decades suggests that the full realization of the potential educational benefits of ICT is not automatic. Jung (2005) asserts that combining ICT with effective pedagogy could be a daunting experience for some institutions since effective integration of ICTs into the educational system is a complex multi-faceted process that involves not just technology. He concludes that if it is not well adopted and domesticated in schools, educators may view the use of ICTs for curriculum delivery as an add-on and not an integral part of teaching and learning. There is, therefore, the need to understand the barriers that affect the processes through which teachers integrate ICT in teaching to the point where technology becomes spontaneously domesticated into teaching and learning process in the humanities classroom.

ICT in the Nigerian Context

Studies have examined the prospects of the use of ICT, especially the application of computers to pedagogical work and practice in humanities education (Umeh 2000; Ruthven-Stuart 2003; Maduekwe 2006; Tinio 2007; Kwache 2007). ICT offers one of the greatest challenges of our time and organizations, especially educational institutions, have found its usage valuable. Such advantages that may accrue to both lecturers and students alike in the use of ICT range from providing lecturers with an efficient and effective language tool (Maduekwe 2006); taking care of students' individual differences (Kwache 2007); making the lessons interesting, easier and more fun (Appoh 2007); and, providing administrative support to lecturers (Anderson 2004).

Davis (2002) and Cronje and Conza (2002) contend that if universities are to compete in global higher education development, they must embrace the technological advancements and use them as a strategic tool, capable of transforming educational practices. Such practices are achievable with technologically literate and critically-thinking workforces who are prepared to participate fully in the global economics. Highlighting the role of ICT in higher education, Yusuf (2005) confirms that institutions across the world have been adopting ICT in an effort to create an environment for both learners and their instructors to engage in collaborative learning and gain access to information. Ololube (2006) add that access to information through ICT increases the information accessible to individuals. This will support them in trying new strategies, thinking and creativity that are reflective in practice aimed at engaging them to new innovations through the use of ICT. Akudolu (2004) is of the opinion that ICT devices and programmes can facilitate and enrich the quality of teaching and learning in humanities classrooms in the areas of listening, speech work, reading and writing. However, to Jegede and Owolabi (2005) it appears that some of the ICT facilities are not sufficiently provided for teaching and learning processes. According to them, this is one of the reasons why some lecturers do not use some of the facilities in teaching.

In studies carried out (Jegede and Adelolu 2003; Bamidele 2006), it was concluded that the use of ICT facilities for teaching and learning (in humanities education) involves various methods which include systematized feedback system, computer-based operation network, video conferencing and audio conferencing, internet, compact disc (CD-ROM) and assisted instruction. Okebukola (2000) succinctly asserts that the effective use of the various methods of ICT in teaching will, to a large extent, depend on the availability of the ICT facilities and the teachers' competence in using them. He opines that higher education institutions should not be influenced by features and functionality of software but rather focus on ICT as a tool to support teaching and learning. Besides, technology should not drive education; rather, educational goals and needs must drive technology.

Recent changes in Higher Education have brought about a cultural shift and led to a review of and reflection about pedagogy (Rajesh 2003). Part of this reflection centres on the move towards widening participation, addressing issues involved in accommodating greater numbers and a greater diversity of students into skill-oriented pedagogy. Ever increasing class sizes, modular frameworks, lifelong learning and an emphasis on skills development have been underpinned by the introduction of student-centred learning and an increasing use of the internet, computers, video, and other technologies as learning vehicles to deliver the educational experience. These changes are visible in subjects that make up the humanities, such as history, languages and philosophy, which involve the study of

culture and ideas, as distinct from the sciences. In fact, it is virtually impossible to escape ICT in almost any facet of life, and humanities education is no exception. An advantage for teachers is the opportunity to use ICT to encourage and enable students to take responsibility, thus enhancing the ability to complete a task and deal with the issues involved in the process.

Humanities Education and ICT

According Eastman (2007), the last two decades have witnessed a proliferation of computer technologies in humanities education. The term ‘humanities’ comes from the Latin word *humanus*, which means ‘human, cultured and refined’. Currently, humanities is a loosely defined group of academic subjects united by a commitment to studying aspects of the human condition and a qualitative approach that generally prevents a simple paradigm from coming to define any discipline. Unlike other subjects, it is not a group of scientific or technical subjects. The humanities are the stories, the ideas and the words that help us make sense of our lives and our world. Humanities education helps to introduce us to thoughts about life and what to do to make life better. By connecting us to other people, they point the way to answers about what is right and wrong or what is true to our heritage and history. The humanities help to address the challenges we face together in our families and our communities as a nation. As a field of study, humanities education emphasizes the analysis and exchange of ideas rather than the creative expression of the arts or the quantitative explanation of the sciences. The compendium of disciplines of the humanities includes:

1. History, Anthropology and Archaeology – the study of human, social, political, and cultural development;
2. Literature, Languages and Linguistics explore how we communicate with each other and how our ideas and thoughts on human experience are expressed and interpreted;
3. Philosophy, Ethics and Comparative Religion consider ideas about the meaning of life and the reasons for our thoughts and actions;
4. Jurisprudence examines the values and principles which inform our laws;
5. Historical, Critical, and Theoretical Approaches to the Arts reflect upon and analyze the creative process;
6. History, Theory and Criticism of the Arts;
7. Aspects of the Social Sciences which use historical or philosophical approach;
8. Humanities – general and interdisciplinary.

These academic disciplines or subjects deal with human values, perceptions, feelings, attitudes and the like. The teaching of the humanities is intended to make students realize that the mere possession of knowledge is useless unless it is put to useful ends. Humanities education, therefore, is the instrument for helping the individual to build lasting societal and personal values, the knowledge and skills needed to become productive and responsible members of the society. In humanities education, therefore, we see the development of the whole person, which is the goal of present-day education. A humanist is one who is able to think critically, solve problems, take rational decisions and contribute meaningfully to society.

There is, at present, a groundswell of interest in how computers and the internet can best be harnessed to improve the efficiency and effectiveness of humanities education at all levels. Some of the major activities and characteristics of humanities are participation in debates, discussions, reading, independent study, critical thinking and research. It is evident that ICT–enhanced learning encourages learner participation and cooperation among students, promotes team spirit, critical thinking and enhances global awareness and much-desired communicative skills. Since the four language skills have an important place in humanities education, adult learners as much as young students can build their communication and interpersonal skills as they use ICT tools to speak, discuss, respond to questions, listen to speeches, etc. The preparation and delivery during such activities can help in fostering critical thinking, self-confidence and assurance, in addition to comprehension skills.

These methods could be supported with such tools as films, slides, video clips, projectors, e-mail, discussion forum, DVD and television programmes. Technology profoundly affects learning and teaching in the humanities as well as the nature of humanities. In most cases as well, traditional materials such as the textbook and chalkboard, and technology such as laboratory equipment, radio, film, projectors and computers have been used to support classroom teaching. All in all, the use of technology to support classroom teaching does not radically change the teaching method. Rather, the teacher remains the key player in determining which, when, where and how to integrate these learning technologies in the humanities classroom.

Theoretical Underpinning and Assumptions: Theory of Domestication

The theoretical underpinning for this present study is based on the Theory of Domestication as propounded by Chigona, Chigona, Kayonago and Kausa 2010; Alampay 2006; Frissen 2000; and Pelgrum 2001). The definition of this and other related terms follows in the next section.

Domestication Paradigm

According to the above-mentioned authors, 'domestication' can be described as the process of technology adoption into everyday life. The framework looks beyond the adoption and use of ICT (as well as gratifications or benefits) to asking about what the technologies and services mean to people, how they experience them and the roles that these technologies can play in their lives. The processes observed in this framework are concerned with how individuals encounter technologies and deal with them, sometimes rejecting them and at other times accepting them (Rogers 2003).

The domestication paradigm was devised by Chigona, Chigona, Kayonago and Kausa (2010). According to them, domestication consists of three main processes, namely: Commodification, Appropriation and Conversation. Some researchers split the appropriation stage into Objectification and Incorporation stages, thus coming up with four stages (Frissen 2000). This study adopted the four-stage process of domestication. Commodification refers to the way a technological product is designed and is given an image by the users as it emerges into the public space. At this stage, symbolic and functional claims about the product are noted. The product is evaluated on how well it would satisfy the teachers' perceived needs (Warschauer 2004). In the case where the teacher has the choice of adopting, the commodification process may affect his/her decision to acquire the product. Once purchased by an individual or an organization, the product or object goes through a process of 'appropriation'. At this stage, the product is possessed by the owner and becomes authentic. When looking at appropriation, the objectification process is considered to examine how the product finds space and enters the geographical area of the owners. Objectification does not necessarily mean the product is accepted by the potential adopters. The product is then incorporated into the daily routines of its owners. Incorporation begins by first integrating the product in temporal structures both formally (in the work schedules) and informally (in the routines and habits).

In the conversion stage, the adopters of the innovation show their adoption by displaying it to the outside world, physically or symbolically (Habib 2004). In the case of ICT for curriculum delivery, the display could be by individual teachers within a school environment or by the entire school as an adopter displaying to other schools. The first two stages of the domestication process are equivalent to what is normally referred to as adoption in most adoption frameworks (Pedersen and Ling 2003). Thus, it is noted that the domestication framework allows for investigating the processes beyond the acquisition of the technology. The domestication framework has been used to study the adoption processes of a variety of technologies, including personal computers, televisions and mobile phones (Pedersen and Ling 2003). Again, it should be noted that although the framework is mainly used to study person or household adoption of technology,

others recommend that it can also be used to study organizational domestication of technology. In this chapter, we employed the domestication framework as the lens to understand the perceived obstacles impinging on domesticating ICT in the pedagogy of humanities education in Nigerian universities.

Research Problem

There is urgency regarding the improvement of the quality of humanities education. ICT is perceived as a necessary tool for this purpose. Adeoye (2009) notes that ICT requires teachers to be committed to a constant and changing learning curve which may involve a mixture of formal and less formal techniques if they are to acquire and develop the skills needed to be effective ICT users. However, he laments that many university lecturers still find it difficult to be potential ICT users, given the difficulties they face. In support of this notion, Webber (2003) notes that globally, there are major obstacles to the domestication of ICT in humanities education which cut across all levels and is still not well addressed. The urgency of action in this regard has become even more imperative, considering the impact of globalization and the rapidly expanding role of knowledge, information and communication technology and the interface between education, society, economy, culture and technology (UNESCO Draft Programme and Budget 2002-2003).

Purpose of the Study

This study therefore sought to determine the perceived obstacles to the use of ICT in humanities education. Secondly, the study aimed at establishing if the obstacles involved vary in different universities.

Research Questions

To achieve the objective of this study, the following research questions were posited:

1. To what extent do health, psychology, power, socio-economic, training, attitude, cultural, political, personal, economic and technical factors militate against lecturers' use of ICT in teaching at the sampled universities in Nigeria?
2. Do these obstacles/barriers vary from one university to another?

Methodology

The study adopted a descriptive survey research design to find out the obstacles to the domestication of ICT in Nigerian universities. The participants in this study were lecturers from four Nigerian universities – two from the south-western Nigeria and two from the south eastern Nigeria. These universities are: University

of Lagos, Akoka, (Univ A), Lagos State University, Ojo (Univ B), University of Nigeria, Nsukka (Univ C) and Ebonyi State University, Abakaliki (Univ D) which were randomly selected from south-west and south-eastern States of Nigeria. We shall be referring to these universities as University A, B, C, and D. Lecturers were selected from the various faculties in these universities via a simple random sampling technique. Sixty lecturers were sampled in each university, giving a total of two hundred and forty (240) respondents.

The major instrument employed in collecting the data for this study was an open type questionnaire, supported with an unstructured interview session. The questionnaire comprised 20 items and each item was structured on a four-point Likert scale, ranging from a score of 1 to 5 (where 1 = strongly disagree and 4= strongly agree). Two lecturers of computer technology and two lecturers in humanities education scrutinized the items of the scale to ascertain their content validity. Their observations and comments were given due consideration, hence the number of items was reduced from fifty two to forty-nine before the final draft. Using the test- re-test procedure, the final draft of the questionnaire was pilot-tested on a group of lecturers (N= 25) teaching in one of the nearby universities but not within the schools selected for the study. The Cronbach coefficient alpha of the instrument obtained was of 0.768; and so the questionnaire was considered adequate for the study.

The study utilized descriptive statistics such as frequencies, percentages, reliability tests and Analysis of Variance (ANOVA).

Results

The results of the data analysis, indicating the mean of all variables hindering the domestication of ICT in humanities education, are shown in Table 15.11.

Research Question 1: To what extent do health, psychological, power, socio-economic, training, attitude, cultural, political, personal, economic and technical factors militate against lecturers' use of ICT in teaching at the universities?

To analyze the research question above, Arithmetic mean was used after rating each response on a 5-point basis. Results are shown in Table 15.1.

Table 15.1: Respondents' Views on Factors Militating Against the Use of ICT by University Lecturers

Factors / Barriers	Mean of Responses	Ranking of Barriers
Health	2.248	5 th
Psychological	1.866	9 th
Electricity (Power)	3.158	1 st
Socio-economic	2.255	4 th
Training	2.125	6 th
Attitude	1.353	11 th
Culture	1.460	10 th
Political	2.507	3 rd
Personal	2.094	7 th
Economic	2.815	2 nd
Technical	Technical	8 th

Table 15.1 shows 11 factors that are militating against lecturers' use of ICT in the universities and indicates the degree of seriousness of the barriers. The most disturbing factor is irregular power supply which pooled the highest mean score (3.158) out of a maximum of 5. This translates to over 63 per cent of the respondents complaining about this factor. The next serious factor is economic which pooled or recorded 2.815 as mean score that translates to over 56 per cent of the respondents. Other factors have different degrees of seriousness in militating against lecturers' use of ICT in teaching except attitude (1.353), culture (1.460) and psychological factors (1.866) do not have any serious effect on lecturers' use of ICT in the universities.

Research Question 2: Do the factors / barriers vary from one university to another?

Table 15.2: The Mean Average Factors Militating Against Lecturers' Use of ICT for Teaching in Different Universities

Factors	UNILAG (UNIV. A)	LASU (UNIV.B)	EBSU (UNIV.C)	UNN (UNIV.D)
Health	2.1944	2.1298	2.5529	2.1142
Psychological	1.1620	1.8846	2.7115	1.7068
Power	3.1759	2.9599	3.5000	2.9954
Socio-economic	2.1528	2.2548	2.5577	2.0556
Training	2.5231	2.1795	1.6442	2.1528
Attitude	.9031	1.5449	1.7215	1.2420
Culture	1.1194	1.8192	1.4567	1.4444
Political	2.1093	2.0740	3.2315	2.0926
Personal	1.6562	2.2660	2.5147	1.9401
Economic	2.3951	2.6603	3.4551	2.7500
Technical	1.6204	2.2067	2.9471	1.5833

Table 15.2 shows the Arithmetic mean scores of the ratings of the factors militating against lecturers' use of ICT for teaching in different universities. The table shows that power is a dominant factor militating against lecturers' use of ICT in all the four universities, as it ranked first in each of them. The degree or level at which the other factors affect lecturers' use of ICT vary from one university to the other. For instance, in Univ.A, the second serious factor is Training (2.5231); in Univ. B, Univ. C and Univ. D, it is Economic (2.6603, 3.4551 and 2.75 respectively). This implies that while the lecturers in the other 3 universities see the economic factor as an issue, at Univ. A, training, rather than the economic factor, is the issue. The least important factor in lecturers' non-use of ICT at Univ. A, Univ. B and Univ. D is attitude, while in Univ. C, it is culture. Table 2 also shows that technical (2.9471) and psychological (2.7115) factors are considered as serious obstacles to lecturers at Univ. C, but they are not to lecturers in Univ. A and Univ. D.

In summary, by examining the means for all factors per university collectively, it was observed that factors that have the greatest effect on lecturers are found at Univ. C followed by Univ. B, then Univ. A and Univ. D.

Discussion

This study investigated the nature of barriers hindering the domestication of ICT in the humanities education unit in Nigerian universities. The results reveal that four major variables – power, economic, political and socio-economic factors ranked highest and combined among the obstacles affecting lecturers' domestication of ICT in humanities education. However, other factors are slightly significant. It is evidently clear that in the four universities – Univ. A, B, C and D – the power factor ranked first as the most inhibiting obstacle in ascending order (3.158), followed by economic (2.815), political (2.507), and socio-economic (2.255); while other factors have different degrees of seriousness in militating against lecturers' use of ICT, with attitude (1.353), culture (1.460) and psychological (1.866) ranking least among the obstacles to the use of ICT in the sampled universities. Furthermore, the findings of the study indicate that erratic power supply is a major hindrance to lecturers' use of ICT, with the highest mean score of 3.158 out of a maximum of 5. This research finding is in consonance with earlier studies by Ushie, Beshel, Asanga and Inyang (2008); Akudolu (2002); Adomi (2005) and Osondu (2006), which asserted that erratic power supply by the Power Holding Company of Nigeria (PHCN) is a major constraint to the use of ICT in such a way that even where the facilities are available, use is impossible. Busari (2006) also confirms that a stable power supply reshapes a nation's economy and mentality towards ICT positively.

The results about the economic and socio-economic obstacles, which pooled 2.815 and 2.255 respectively as mean scores, are significant and potent as part of the reasons that often dictate lecturers' attitude towards acceptance, acquisition of knowledge and skills, integration and effective diffusion and domestication of computer technology in humanities classrooms. Implicitly, the economic and social-economic context of the institutions also affects ICT adoption. In an affluent setting like Univ. A, many lecturers have access to computers and the internet at home and therefore are comfortable with the use of technology within the school environment. In contrast, many institutions in disadvantaged areas do not have constant power supply, let alone ICT amenities at home, and are therefore less familiar with their use. Such lecturers have low propensity towards the use of computers. This finding is in consonance with Owhotu (2009) who notes that many states in Nigeria, especially but not exclusively the northern states, with low education indicators, are trying to expand the system at the same time as improving the quality and outcomes of the institutions. In these settings, the ICT output is low and the demand for skilled graduates is high. Salawu (2002) found that government policies as well do not make provision for adequate funds for

procuring ICT infrastructure in higher institutions. Hence, lecturers who see themselves as being computer competent and confident are favourably disposed to self-sponsorship.

Linked to this is the problem of limited resources which affects the domestication of technology negatively. Most of the institutions sampled suffer high student ratio which has discouraged some lecturers from incorporating ICT in their teaching and learning. This finding corroborates Udeani's (2006) assertion that adequate equipment, connection cost and population of students are generally excessive barriers for developing countries in Africa, South Asia, Latin America and the Caribbean.

Another major outcome of this study is the issue of health variable, which recorded a mean score of 2.248, as a serious contributory obstacle. This outcome indicates that, despite the re-assuring measures taken by some institutions, some lecturers have attributed various health problems to visual strain, frontal headache, mental fatigue, ruptured eye vessels, swollen hands and fingers. This finding coincides with previous findings by Baylor and Ritche (2002), Namlu and Ceyhan (2002) and Deniz (2007) who posit that headache, muscle strain, skin allergies and eye damage are all common health hazards to prolonged computer use.

The result of this study further reveals that politics significantly stands as an obstacle to the diffusion of Information Communication Technologies, with a mean score of 2.507. By implication, contextually different environments bring about different challenges in the implementation and utilization of ICT within pedagogical practice. For instance, in some states, ICT policy may not augur well for some institutions. In some institutions where there is a top-down management style with little consultation between levels, staff members may feel coerced into using ICT and therefore may not use it effectively. (Czerniewicz and Brown 2009). Lecturers may feel constrained by lack of institutional support and political will and may feel unsure of the direction they may take and the purpose the use of ICT is meant to serve. Furthermore, research has confirmed that institutional politics, vision and leadership provided in well-managed institutions enable lecturers to use ICT more productively than their counterparts in institutions which are not well managed politically (Czerniewicz and Brown 2009).

Findings of this study show that lack of adequate training is equally emphasized as the sixth serious barrier against lecturers being good users of ICT. The study also reveals that most lecturers prefer the traditional method of teaching which is the 'chalk-talk' method to using ICT. This finding is in line with the argument of Ikoro (2002), who states clearly that lecturers are so used to the traditional method of teaching and therefore see the introduction of ICT as time-consuming and sometimes unnecessary. In support of this notion, Auala (2003) and Owhotu (2009) note that institutions of higher learning in Nigeria have not taken up the challenge to professionally train their lecturers in ICT use, which is responsible

for the latter's indifferent attitude to the use of ICT. The professional development of lecturers sits at the heart of any successful technology and education programme. Baylor and Ritchie (2002) and Sofoluwe and Badmus (2004) conclude that professional development has a significant influence on how well ICT is embraced in the classroom.

Surprisingly, attitude, culture and psychology as variables, with a mean score of 1.353, 1.460 and 1.866 respectively, did not contribute much to the obstacles to the domestication of computer technologies. The reason for this is not far to seek because teachers may have the right attitude, but once the right support and infrastructure, such as physical space, furniture, electricity and internet connectivity are not available, it may be difficult to benefit from technology. This outcome thus negates previous research by Nwagwu (2006) who noted that if lecturers want to successfully adopt the use of technologies in their lectures, they must possess positive attitudes. An important factor in the implementation of ICT is the users' acceptance which in turn is influenced by their attributes and attitudes towards the media.

Recommendations

1. In order to revamp the humanities education system, there is need to produce a technologically literate workforce who are competent to rise up to the challenges of technological innovations. ICT must be given the necessary attention by institutions to ensure it is integrated and domesticated into our educational system.
2. Effective use of the various methods of ICT in humanity education will invariably depend on the availability of the ICT facilities and the teachers' competence in using them. Government at various levels should therefore equip teachers with the necessary tools, such as computers, computer laboratories, laptops and technical assistance that would enhance their computer literacy. Since frequent use of computers is an antidote for computer anxiety, humanities education should ensure that school laboratories are internet networked so as to encourage more teachers' access to computer technologies for the present and future use.
3. Teachers' professional development is a lifelong phenomenon. Like any other reform effort, the use of technologies cannot be achieved by a one-shot training course. As technology is changing very fast, teachers need to be updated with these changes in order to get positive results in humanities education.

Although humanity education programmes do not typically include technology training, it is now quite obvious that interactive and communication technology training needs to be compulsorily incorporated into the pedagogy to achieve the greatest educational impact and domestication.

Conclusion

This study has shown that despite the willingness of lecturers to integrate ICT into their teaching and learning processes, variables like power, economic, political, training and health issues in institutions make it difficult for a firm ground to be established for the domestication of ICTs in humanities education in the sampled universities. This implies that, in reality, access does not equate effective usage and the achievement of the desired impact. The proliferation of technologies has complicated the teaching-learning process; and so, finding the best ways of integrating technology into classroom practices is one of the challenges the twenty-first century teachers face. Furthermore, integrating and domesticating ICT into humanities education is much more complicated because of the different perspectives of the compendium of subjects and disciplines involved.

In this respect, teachers as sole implementers are expected to have knowledge, skills and positive attitudes towards the implementation of ICT in institutions of higher learning. We need to acknowledge that the success of implementation is more serious than just providing computers and securing a connection to the internet. According to Fullan (1991), the process of change implementation is planned along three stages, namely: adoption, implementation and institutionalization. Consequently, awareness of any obstacle that teachers face could lead to the development of solutions to the obstacles, useful training programmes and incentives for the use of ICT.

Overall, no single solution exists to address the immense challenges of ICT domestication in a second-language context. Perhaps, both teachers and trainees require ongoing support and opportunities to experiment with ICT skills and strategies in pedagogical innovation perspectives. Postman (1993) asserts that in our technicalized, present-centred information environment, it is not easy to locate a rationale for education, let alone impart ICT convincingly. To achieve the goal of humanity education, therefore, we need teachers and students who will understand the relationships between the techno and our social and psychic worlds, so that they may begin informed conversations about where technology is taking us (Warschauer 2003). This does not mean that ICT should replace the traditional method of teaching. Rather, effective domestication of ICT into the traditional method in the humanities will make room for a balanced outcome.

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16

Curriculum Theorizing and Practice in Teacher Education

Bade Adegoke

Introduction

The training of teachers, either initial training or in-service or on-service training, should focus on their competence and effectiveness in the teaching-learning milieu. This is inevitable if the professional problems of teacher education are to be strategically solved and the foundation as well as the quality of the educational system consolidated and further enhanced. It is certain that only competent, efficient, effective, transformative, conscientious, creative, reflective, honest, dedicated and well-motivated teachers can impact positively and significantly on the education system and national development as well as the restoration of professional dignity. It is also certain that a creative, reflective, effective, transformative teacher education is inevitable for the preparation of professional teachers as profiled above.

One tends to agree wholeheartedly that the school is worth precisely what the teacher is worth. Properly trained teachers play an important role in the complete wellbeing of a nation. Well-qualified, competent and effective teachers are the only people that can really make a difference to teaching, learning and the quality of a nation's workforce; hence, the importance of teacher education.

Curriculum Theorizing and Practice

Curriculum theorizing is both an art and a science. As a worthwhile field of study in teachers' education, it involves propositional knowledge (knowing what) and practical knowledge or process knowledge (knowing how). Theory and practice are indescribably interwoven in the field of curriculum, where any good theory, when applied, should enhance the practice. In curriculum theorizing, the crux of the matter is to provide practical answers to very practical curriculum questions.

The test of any good curriculum proposition is whether it can guide practice. There is nothing more practical than a good theory. It is also essential that good practice is based on theory. This explains our basic interest in praxiological theories without overlooking the usefulness of the other types. The term 'praxiology' is derived from the Greek word 'praxis' meaning 'a doing' or 'an action'. Praxiology is the key to competence education and to most other purposeful education at all levels. It is based on descriptive and situational knowledge. It goes beyond this to explore for efficiency, effectiveness and rationality in practice.

Curriculum theorizing has to do with philosophizing, conjecturing and understanding the complexities of curricular issues, techniques, paradigms and development at its frontiers. The nature and essence of teacher education demands that curriculum theorizing should be of direct and practical help to classroom teachers.

Curriculum theorizing has two vantage points in the context of teacher education: one conceptual and the other methodological. From a conceptual perspective, curriculum theory offers trainees a framework for thinking about – and making judgements about – curriculum. The conceptual perspective in curriculum theory seeks to justify curricular decisions by reference to a grounding base of knowledge about the nature of learning and the effect of teaching choices on various learning outcomes. From a methodological perspective, curriculum theorizing offers a range of procedures for attempts to understand and advance curriculum theory and practice by grounding them empirically in systematic studies of student learning and classroom understandings, and ensuring appropriate curriculum development products.

Curriculum theorizing should help trainees and teachers to engage in the process of curriculum development. Curriculum theorists should theorize and be involved in the practical.

Furthermore, empirical investigation in curriculum theorizing should aim at revealing what it is that students/pupils are being taught and what it is that they are learning and what they have actually learnt, the appropriateness of what is designed and provided, as well as the use and effect of resources.

Curriculum theorizing in teacher education should bring to bear, on educational matters in general, the outlooks of scholar disciplines and socio-political perspectives that have been overlooked or largely ignored. It should develop and insist on the use of rational guide and articulate the underlying reasons, rational foundation and ground for curriculum practice and offer explanation and expositions.

What is fundamental about the field of Curriculum Theory in Teacher Education?

- It is one of the growth points in education;
- It is an art and a science;

- It is a compendium, which is fundamental in its unique form of knowledge;
- It has its own foundations and it tilts towards integrative tendencies;
- It is a field of inquiry with adapted substantive and syntactical structure drawn largely from philosophy, sociology, history, psychology, anthropology, economics, management, as well as learning and teaching theories. Thus, it is a unique set comprising the intersection of elements from several others;
- It fits a 'field' more than a 'form' of knowledge, using Hirst's postulation of the fundamental structure of knowledge;
- It is clearly centred on such foci as purpose, content, experience, evaluation and contextualizations;
- It has a community of academic experts (curriculum theorists), and curriculum practitioners communicating with one another in the search to give meanings to curricular concerns;
- It has a history and its tradition is being rigorously intensified and consolidated;
- It has a heritage of literature and a communication network manifested in professional bodies, journals, and meetings run by curricularists;
- It has emotive appeal to its adherents who enjoy working esoterically within it;
- It is apparently a high-status subject as a core course in all colleges of education, faculties and institutes of education, and universities of teacher education.

Domains of Curriculum Theory

George Beauchamp (1981) divides curriculum knowledge into planning, implementation and evaluation. Fenwick English (1983) views the domains of curriculum in terms of ideological (philosophical-scientific), technical (design) or operational (managerial) issues. Edward Short (1987) outlines the domains into policy making, development, evaluation, change, decision-making, activities or field of study, forms and language of inquiry (or theory). Linda Behar (1992) identifies nine curriculum domains as: curriculum philosophy, curriculum theory, curriculum research, curriculum history, curriculum development, curriculum design, curriculum evaluation, curriculum policy and curriculum as a field of study.

On the basis of the curriculum themes covered by different major curriculum textbooks, journals and postgraduate studies in teacher education, the following appears a more comprehensive boundary of curriculum theory, bearing in mind that the frontiers of any discipline are elastic and dynamic:

- Art and Practice of Curriculum Development;
- Curriculum for Business and Industry;
- Curriculum Commissions and Policy;
- Curriculum Context;
- Curriculum Design;
- Curriculum Thought;
- Curriculum History;
- Curriculum Evaluation and Assessment;
- Curriculum Implementation;
- Curriculum Integration;
- Curriculum Innovation and Diffusion;
- Curriculum Issues and Trends;
- Curriculum Leadership and Supervision;
- Curriculum Monitoring and Evaluation;
- Curriculum and Public Debate;
- Curriculum Planning;
- Curriculum Research;
- Curriculum Politics;
- Curriculum Control;
- Curriculum in Subjects;
- Curriculum Understanding;
- Borderless Curriculum;
- Futuristic Curriculum;
- Multi-cultural Curriculum; and
- Theory of Knowledge and Content Selection.

It is also important to note that curriculum research is conducted in seven different traditions of research:

- Analytical Studies;
- Descriptive Studies;
- Evaluative Studies;
- Interpretive Studies;
- Model or Organizational Scheme Studies;
- Predictive Studies; and
- Theoretical Studies.

Three major paradigms – interactionism, functionalism and conflict theory – dominate inquiry in curriculum research at present:

Role of Curriculum Specialists

The emergence of curriculum theory as a field of study in teacher education has resulted in the concomitant creation of its specialists (curriculum theorists or curricularists as distinct from methodologists). The work of such curricularists is varied and necessary in any educational system. It includes:

- Obtaining up-to-date information about local, national and international trends and conditions that influence education in general and curriculum in particular, and providing means of encouraging teachers to inform themselves about such facts;
- Surveying school curricula to determine how well classes and curricular activities comply with present-day opportunities and needs of children;
- Securing resources needed for new or revised curricula;
- Organizing task forces for development or improvement projects and monitoring their work;
- Working with other school service providers to integrate curriculum with other school services;
- Helping to evaluate continuously both the appropriateness of the curriculum and the quality of the curriculum development programmes;
- Working with other stakeholders to develop school curricula that fit present-day opportunities and challenges;
- Providing situational analysis data and other vital statistics for curricular decisions;
- Providing indispensable technical leadership role in curriculum development;
- Providing consultancy services on any technical curricular issues;
- Facilitating the production of appropriate curriculum materials (textbooks, curriculum, syllabus, scheme, lesson plan, etc.);
- Redefining or improving content;
- Acting as a change agent;
- Coordinating or evaluating students' needs survey;
- Serving as a curriculum supervisor;
- Understanding and reflecting current research in teaching, learning and curriculum;
- Developing standards for curriculum and instructional evaluations;
- Having skills in human relations and social engineering, monitoring and evaluation;

- Coordinating or planning staff development programme, including large classes;
- Facilitating the enrichment of curricula, etc.;
- Planning or scheduling classes/school calendar; and
- Blending theory building with practice.

Curricular Challenges in Teacher Education

A sober reflection upon the commonplace debate, dialogue, observations, research report, monologue and soliloquy about teacher education may reveal curricular challenges requiring honest, pragmatic but realistic answers to a number of pertinent questions. Such questions include the following:

- Who is a teacher and where does the distinctiveness of teaching as a profession lie?
- What should be the requirement and procedure for recruiting and retaining quality students for teacher education?
- Does teacher education influence significantly the 'native' theories of pre-service teachers?
- What are the desired and desirable roles of teachers and related worthwhile curriculum needed for them to optimally perform those roles?
- Is there any connection or disconnection between theory as taught in teacher education institutions and practice in the field, i.e. does the curriculum of teacher preparation match the needs of the schools and classrooms?
- What will be the influence on the quality of the teacher training if one shortens the time of study in favour of a longer time-span for internship?
- Should teacher educators not focus on identifying decay, redundancies, overlaps and gaps in their existing teacher education programmes?
- Should teacher educators not consider how the world in future may be different from what it is today and how that difference will affect education, particularly teacher education?
- What is the most worthwhile structure of the teacher education programme and how best can this be conducted?
- Are the foundation courses not disconnected, disintegrated and unrelated to practice and how can foundation courses be reconceptualized and then reconnected to the substance of teacher education?
- In view of global interdependence, should teacher educators not develop a global perspective for teacher education programme without jeopardizing local relevance?

- Should the preparation of specialists like guidance counsellors, adult educators and educational administrators be postgraduate programmes in order to focus adequately on professional development?
- Is teacher educational programme not lopsided in favour of pedagogy at the expense of the content of the teaching subject?
- What model of teacher preparation and professional development should a university of education adopt to be unique and worthwhile for that purpose, both locally and internationally?
- What is quality teaching practice and how can it be best conducted?
- What is that fund of knowledge upon which the whole teacher education as well as the teaching profession rest?
- If teaching is to be a genuine learned profession, should the education of the future teacher at the undergraduate level not be an education in the liberal arts and sciences, not in pedagogy?
- Should teacher education not produce men and women with disciplined minds, cultivated interests, and a wide range of professional basics and competitive knowledge?
- How can teaching be more attractive to young men and women of serious intellectual purpose and high intellectual capacity?
- What constitutes the fundamental components of teacher education and how can the various components and elements of the teacher education programme be profitably proportioned, combined and ordered?
- What does inclusion really mean and how can it be best provided for in teacher education?
- Is quality professional teacher training possible by means of distance training?
- Can we comfortably achieve optimal professionalization of teaching without addressing the shortcomings, lapses and gaps inherent in initial and further teacher education programmes?
- Do licensing requirements limit or encourage the diversity of the teaching force?

Admittedly, the various observations and highly charged debates have somehow been generalized in these questions in order to focus the discussion. A very objective analysis of these and other questions readily reveals merit, confusions, ignorance, misconceptions, mischief and logic. Teacher educators should neither ignore them nor react in panic. We need to be guided by the normative, ideographic and esoteric imperative of the teaching profession, without being oblivious of the clarion call for the enhancement, and without being apologetic for whatever

borders on worthwhile professionalism. A teacher education college, faculty or institute should prove itself worthy of its existence in the discharge of its statutory professional functions.

Who is a Teacher?

A teacher is a properly trained, certificated, registered and licensed professional who has attended a teacher training institution and successfully completed its prescribed rigorous systematic and validated teacher-education programmes in the art and science of teaching his or her specialist teaching subject(s) at a particular level of the educational system. The essence of being an effective teacher lies in knowing what to do to foster learning and being able to do it.

What is Teacher Education?

Teacher education, commonly referred to as planned teacher preparation and professional development, is the art and science of institutionally providing systematic pre-service, in-service or on-service training to education students in the theoretical basis, specialized knowledge and the acquisition of practical and applied skills, concepts, principles, strategies, techniques and styles with adequate attitudes and orientations, with a focus on professional standards, professional ethics and professional competence, efficiency and effectiveness.

Teacher education involves the systematic integrated formal professional training of a prospective teacher. Teacher education is a complex, multifaceted, interactive process made up of in-service, pre-service, on-service training and lifelong education. The teacher education system relates to the context in which such training is given to trainees for the pre-primary, primary, secondary and tertiary institutions.

Every form of teacher education involves a close study and understanding of the complex nature and process of teacher, learner, teaching and learning; and systematic study of the joint and independent activity of the teacher, the learner and the environment in any type of classroom. Teacher education is central to both quality of education and development. Hence, the diverse interest in the philosophy, goals, content, structure, quality control, certification and procedure of the teacher education programme.

Teacher education is a necessity, not a luxury, as no meaningful development can take place without adequate manpower resources; and no adequate manpower training can take place without competent teachers who are products of effective teacher education programmes. As long as there is the public demand for teachers, the need for teacher education and its institutionalization will continue to be inevitable.

A teacher is made, not born, even though certain individuals may possess certain traits that make them particularly and easily amenable and more responsive to certain aspects of teacher education. Teaching is a profession. So, it requires competence in subject mastery, pedagogy, teaching practice, communication and general studies. A teacher should be efficient and effective. A teacher training centre should be strategically placed to provide these essential components based on certain fundamental principles like creativity, collaboration, critical inquiry, classroom practice, contextualization, action research, knowledgeable values, ethics, diligence, virtual learning, communicability, professional commitment, local and global standards. Pedagogy is the set of concepts and skills (i.e. theories, principles, strategies, techniques, styles, etc.), abilities and dispositions a teacher professionally employs when helping, aiding or facilitating others to learn.

Teacher education is the statutory function of pre-service and in-service training agencies like teacher training colleges, colleges of education, polytechnics (with special bias for teacher education), university faculties of education, institutes of education, university of teacher education and the National Teachers' Institute. There is also an increasing use of non-conventional methods like distance learning and school-based training with no institutional residence. The common nomenclatures for certification include: T.C.II, Associate Certificate in Education (ACE), Associate Diploma in Education (ADE), Nigeria Certificate in Education (NCE), BEd or BA/B.Sc Education and the Postgraduate Diploma in Education (PGDE), apart from other postgraduate studies in education.

The above structure is based on a two-pronged approach. There is the consecutive approach which provides for the acquisition of intellectual knowledge and competence in a specific subject as a foundation before exposing student teachers to the fundamentals of pedagogy as typified by the PGDE Programme. There is also the concurrent approach whereby subject mastery and fundamentals of pedagogy are offered concurrently as training programmes progress, as seen in the BEd or BA/B.Sc teacher training programmes. Each approach has its own merits and demerits. For example, although teachers require subject mastery, the notion of 'kicking pedagogy upstairs' is worrisome, especially when one bears in mind the amount of work required and the limited time available. The arrangement whereby pedagogy is deferred until after scholarship in subject areas encourages detachment which is professionally injurious. Equally worrisome is the alleged greater emphasis given to education courses at the expense of subject mastery in a concurrent approach (Adegoke 2000). The ratio may range between 70-80 per cent subject content and 30-20 per cent pedagogy.

Some Paradigmatic Shifts in Teacher Education

The paradigmatic shifts in teacher education include:

- teacher-centred to resource-oriented learning including ICT-based teaching and learning;
- closed to open systems without formal parameters;
- provider-driven to user-centred curricula;
- factual work to effective performance-based learning contexts;
- isolated to network environments;
- one-way to interactive creative, reflective and transformational teaching;
- local/national to global context (borderless education);
- single-subject mastery to broad-based integrated education with specializations, capabilities, transformability, competence and effectiveness;
- change resistance to anticipatory educational management.

It is also increasingly noticeable that there is likely going to be:

- greater emphasis on skills and innovative tools;
- greater emphasis on processes, on learning how to learn, and on basic principles, as the obsolescence of narrow factual knowledge will be more noticeable in the era of rapid scientific and technological discoveries;
- more integrated (as opposed to parochial subject-based) curricula;
- greater reliance on materials outside the specific basic texts and textbooks generally, owing to information technology;
- greater emphasis on linking school work with the world of industry/work, labour market, self-reliance and self-empowerment;
- increasing need for new devices for exposing student-teachers to school practices, e.g. micro-teaching, videotaped classroom interaction, conferencing, etc.;
- increasing need for pre-teaching practice and post-teaching practice (workshops) activities;
- tolerating and dealing with students' outrageous (unusual) behaviours based on modernity;
- greater public debate on the structure, curriculum, certification, competence and effectiveness in teacher education;
- greater emphasis on linking professional development to the life and culture of schools.

Characteristics of Effective Teacher Education

It is very clear that an inevitable process of change in teacher education should indeed be largely driven by the teacher education sector itself. If this is not the case, then grave consequences could result. To be effective, the teacher training institutions must strategize and re-strategize by:

- being creative, innovative, responsive and transformational;
- offering and upholding high quality training based on a balanced curriculum for knowledge and professional excellence;
- ensuring competitive entry on intellectual merit and inherent interest;
- offering lifelong learning opportunities, including learning-to-learn;
- linking to the world of work and contextualization, and serving personal, local, national, regional and international development needs;
- ensuring optimal professionalization of teaching and its effectiveness;
- cultivating professional dignity and confidence;
- using the cognitive apprenticeship model and mentoring system;
- using school teacher as legitimate participant in the professional development of the intern;
- introducing action research as a tool for engaging in reflection on trainees 'native theories' as well as the problems they encounter in their teaching;
- integrating technology in the preparation of teachers;
- recruiting, training, re-training and mentoring well-motivated quality staff;
- ensuring well-articulated extended field experiences sequenced with theory;
- ensuring a well-defined, accepted standard of practice and evaluation to guide modular course work and clinical experiences;
- enforcing policy on ethical and professional standards;
- using effective quality control and quality assurance mechanisms;
- enhancing creativity, motivation, good personality and positive attitude as models;
- ensuring adequate funding and sustainable development based on strategic action plans.

In an article entitled 'Nigeria Teacher Education System in the 21st Century', Adegoke (2000) argued for a balanced competence-based teacher education as a panacea for coping with the various fundamental challenges facing each of the five components of teacher education, namely:

- General education (communication skills, personal relations skills, teamwork, generic skills, etc.);

- Educational sciences (the foundations, curriculum and instruction, management disciplines theory to guide practice, etc.);
- Specialized subject matter (content knowledge of specific teaching subjects, e.g. geography and physics);
- Specialized educational services (guidance and counselling, special needs education, adult education, etc.);
- School practice (internship/practice teaching/practicum).

We should try to look at each of these components in the context of the questions listed at the beginning of this chapter. Each of these components is problematic in terms of quality, quantity and structure. The quality of teacher education is central to its effectiveness. Quality must be seen in its multi-dimensional perspectives as an objective to be reached in all processes of teacher education. Quality is linked to relevance. Relevance is considered particularly in terms of the role of teacher-education as a system, and the relationship of each of its components to teaching, the education system and the society's expectations. The real professional issue in teacher education is competence-based preparation and effective classroom practice. What should be the proportion of each component in terms of structure, coverage, depth and duration? The structure is concerned with the organizational arrangement like content, length of training, time-tabling, sequence, balance, integration, examination, certification and licensing. How should the components of teacher education be proportioned, combined, ordered, presented and evaluated?

Objectives of Teacher Education

The opportunities and challenges associated with teacher education could be better appreciated by considering the objective of teacher education as stipulated in National Policies on Education. For example, the National Policy on Education (NPE) (4th edition) for Nigeria (2004) stipulates that the objectives of teacher education are:

- to provide highly motivated, conscientious and efficient classroom teachers;
- to encourage further the spirit of inquiry and creativity in teachers;
- to help teachers fit into the social life of the community and society at large;
- to produce teachers with the intellectual and professional background adequate for their assignment; and
- to enhance teachers' commitment to the teaching profession.

The Presidential Committee on the Review of Education Reforms in Ghana stated the objective of teacher education in Ghana as the 'training and development of the right type of teacher who is competent, committed and dedicated'. Such a teacher should be capable of:

- applying, extending and synthesizing various forms of knowledge;
- developing attitudes, values and dispositions that create a conducive environment for quality teaching and learning in schools;
- facilitating learning and motivating individual learners to fully realize their potential;
- adequately preparing the learner to participate fully in the national development efforts (Republic of Ghana 2002).

These broad, meaningful, focused and pragmatic objectives reasonably became the technical base and useful reference points for deliberating, determining and evaluating policy and practice in teacher education at various levels. It is useful to determine the extent to which each of these objectives has been pursued, achieved and sustained, using available analytical variables associated with attendant input, antecedent process and output indices. The result will be a true manifestation of the state-of-the-art and will provide useful inputs.

What then should be the role of teacher educators? They include:

- guiding and facilitating the development of trainees in the acquisition of knowledge and skills, self-understanding, pedagogy and collaborative school culture;
- acting as models of best practices;
- conducting research, particularly action research, into teaching, teacher education, curriculum relevance, cognitive learning styles, etc;
- understanding and implementing policies on teacher education;
- participating in policy formulation/analysis;
- participating in curriculum development, evaluation and reforms;
- providing services as a resource person, consultant and as a professional critic and energizer.

Models of Teacher Education

A review of available literature on curriculum theorizing for models of teacher education shows variations in perspectives, conceptualizations, structure and value systems. It is, therefore, not uncommon to find models based on teaching and learning methods, values, morals, institutional framework, philosophical reflections, typical teacher provision and normative image. Although there are observable conceptual variations in the available theoretical framework, the pervasive themes include reflective practice, creativity, transformational practice, decision making, inquiry, effectiveness and competence. It may suffice in this attempt to select some models for illustration, amplification and further investigation and discussion.

Models for Teaching and Learning Applied to Teacher Education

Instructor-centred Model

This is the most frequently used instructional model at the tertiary level, including education instructions. The instructor decides on what measurable information to transmit and the students try to acquire the information and demonstrate adequate knowledge acquisition. Typical materials in this model include curricula, syllabi, reading list, pre-determined assignments/projects, tests, etc.

Student-centred Model

This model may be found on rare occasions in the on-service and in-service programmes for practicing teachers. The over-arching principle is student control of the learning process. The instructor only operates as a facilitator.

Community-centred Model

Community found some researchers and practitioners experimenting with programmes and courses based on the model. An example is *Reading Recovery Teacher Training* by Clay and Watson (1983) and Paula Moore. It is the most appropriate for guiding teachers' learning because it focuses on discussion.

Flexner (1909), an educator model for medical education, requires two years of basic science, done discipline by discipline, before any clinical work is permitted. John Burgess of Columbia University had in 1884 argued for the importance of foundations in professional education. Larry Cremm's *The Transformation of the School* is a history of progressivism and progressive education in the United States as well as the account of the creation of a very special school at Teachers College, Columbia University, called the Lincoln School. This was created to exemplify the principle that there is something more important than the classic disciplines for constructing curriculum; that the curriculum ought to be constructed around real events, real problems, real tasks and real projects that students could engage in.

Lee S. Shulman's argument for a withering away of the field of educational foundation was based on his belief that it is currently presented as separate and disconnected studies in psychology, sociology and philosophy of education, etc. In his view, foundation must be given as an integral part of the connective tissue that gives shape and meaning to the education of teachers. To him, the true foundation disciplines are the arts and sciences and that foundation should be taught in a way that it is bound up with the content of instruction. Hence, it does not make sense to separate the content from the pedagogy.

Deweyan Kind of Integrated Model of Teacher Education

Dewey (1991) believed that teachers must be more than 'subject matter specialists'. He took a more integrated view of the knowledge base for teacher education. Dewey was a strong advocate of social and psychological foundations in a manner

that was integrated with the teaching of curriculum and the teaching of pedagogy. He was of the view that it was impossible to divorce the question of methods from that of subject matter. He called his school in the University of Chicago Campus a laboratory school and not a training school.

Dewey's overall plan for teacher education included the study of teaching methods and activities-centred curriculum. Dewey wanted prospective teachers to link theory to practice. He argued that education is a discipline.

Models for the Provision of Teachers

There are basically three possibilities for the provision of teachers to schools (Kachelhoffer 1995):

- appoint teachers with no academic or professional qualifications in schools. The use of teachers with no academic qualification is a near disastrous practice for the school system;
- appoint partially trained teachers in schools. This can also become a highly unsuccessful practice;
- appoint properly trained, competent and effective teachers in schools. This is the ideal all over the world and this is the one to strive for.

Models of Teacher Education based on Institutional Frameworks include:

- Three-year model for direct entry admission;
- Four-year BA/BSc Education Concurrent Structural Model. A one-phase model containing academic and professional preparation – an integrated programme;
- Five-year BA/BSc Education Sequential Structural Model (Education deferred till the fifth year) – a two-phase model;
- Five-year BA/BSc (Honours in teaching field) culminating in Masters Degree or PGDE in Education. This is also sequential – and a two-phase model;
- Structural Graduate Programme for graduates either for the award of PGDE or Master's Degree in Education, for graduates from recognized higher institutions. The award of Master's Degree is meant to attract bright college and university graduates into the field of teaching (quite useful during a period of teacher shortage and perceived inadequacies). These programmes differ from the traditional Master's Degree in Education because they are initial licensure programmes. This is also a two-phase model;
- Alternative structural teacher education programmes are often created to respond to shortage of teachers but, more often, they result from

dissatisfaction with the quality of the traditional programme graduates. They provide short, intense, remedial introduction to school and schooling prior to employment or in-service. This approach could be described as apprenticeship or on-the-job training. The emphasis is more on content knowledge and less on pedagogy. It is site-based.

Models Based on Curriculum Organization

In teacher education, the curriculum can be organized in three ways:

- *An integrated programme* – academic studies and professional preparation are totally integrated. No academic territoriality is allowed and there is collaboration and mutual respect in the development and teaching of classes;
- *Parallel or concurrent programme* – academic studies and professional preparation take place at the same time. The identity of disciplines is maintained. There is intra-departmental, inter-departmental and inter-facility dialogue and collaboration. Teaching can be synchronized;
- *Consecutive programme* – academic studies and professional preparation follow each other.

Models of a Teacher's Work

Mentor (2011) has tried to draw out four competing models of – or approaches to defining – teachers' work. These are the effective teacher, the reflective teacher, the enquiring teacher and the transformative teacher. In whichever of the various models, the curriculum for teacher training usually consists of five parts as identified earlier in this chapter, viz: general education, educational sciences, specialized subject matter, specialized educational services and school practice.

A Proposal

In the context of the discussion so far and the need for inevitable pragmatic but realistic and curricularist responses, our proposition is that we need an eclectic holistic, worthwhile, competent and effective teacher education model.

The conceptual framework for this proposal centres on worthwhileness. The use of worthwhileness is limited to seven of its variables as referential precepts. These are relevance, scope, sequence, balance, timeliness, competence and effectiveness.

The relevance of the teacher education programme is used here as a measure of the relationship between the programme and the needs of the trainees, the society, the nature of the discipline and professional requirements. If it can be demonstrated that the relationship is poor, then the programme suffers from impoverishment and imbalance. The matrixes of relevance as developed by Sheman

Stanage (1976) offer a very useful referential taxonomy of relevance, viz: syntactical relevance, descriptive relevance, etymological relevance, metaphorical relevance, typical relevance and paradigm relevance.

Conklin (1968) identifies seven types of relevance as logical relevance, causal relevance, aesthetic relevance, teleological relevance, correlation relevance, phenomenal relevance and identity relevance.

Scope deals with the breadth and depth of the learning experience (subject content, pedagogy, etc.) presented in the programme. A rational sequence is expected to be the product of the interaction between what is known about child growth and development and what is valued by subject experts (perspectives, skills, techniques). Types of sequence include time order, chronological order, logical order, level of difficulty, etc. Concept mapping is a useful strategy here. The concept of balance considers the critical issue of giving proportionate, adequate and optional considerations to the input that each component of the programme should make to the entire programme. If this is not attained, the programme is out of balance – it is lopsided. A competence-based teacher education programme is the one that focuses on the ability to cope with basic and general problems and challenges encountered on the job or at work. It is essentially criteria-referenced. The emphasis is on productive work, empowerment, task management, task skills, environmental management, contingency management, intellectual skills, cognitive strategies, information, attitudes and motor skills, etc.

Competence is seen as the ability to cope with a certain class of problems encountered on the job or at work or any desired activity. Competence education is more than mere scholastic achievements. It pertains to how well the educational system prepares the students to become responsible professional teachers and instils in them attitudes, moral values and abilities relevant to the modern teaching profession. A fully competent professional is one who can cope successfully with any problem or task requiring the application of knowledge, attitudes and skills already acquired. The capability to harness specialized knowledge to the solution of the practical classroom problems, whether personal, professional or social, may conveniently be labelled competence. The emphasis is on productive work, empowerment and sustainability, thereby giving adequate coverage to capability, coping, creativity and cooperative action as the four fundamental elements of competence. In the United Kingdom, competence has come to reflect expectations of work place performance (Fletcher 1992:18). Mansfield and Matthew's job competence model (1985) provides a wider and less mechanistic view of competence than this definition suggests. The model, as adapted from Elizabeth Rolls (1997: 198), makes visible four different elements, which are required for competent practice and effectiveness in a teaching-learning context.

Assumptions

An effective, eclectic, holistic and competence-based curriculum design for teacher education is based on a number of fundamental assumptions. These are:

- that teacher education must possess certain unique and specialized knowledge, skills, techniques and professional dispositions capable of facilitating the balanced empowerment of its trainees;
- that sustainable empowerment through curriculum offering ultimately depends on enhancing trainees' capacities as individuals and groups to improve their own lives and to take greater control over their own destinies;
- that every profession has a knowledge, procedural ethical value and attitude base, and these will usually be learned most efficiently in close juxtaposition;
- that the multifarious roles and functions involved in teaching can be defined and expressed procedurally (not necessarily mechanistically);
- that trainees of intellectual quality found in a teacher training institution for a specific future teaching role, when given appropriate instruction, can all master the prescribed basic performance and operate competently and effectively;
- that learning results from experience, and the more meaningful and significant the experience in teacher education, the more it is learned and applied;
- that greater opportunities for self-employment and creativity can be fostered if the trainees develop greater skills in decision-making, creative problem-solving, adaptability, inquiry resourcefulness collaboration, personal commitments and sustainability, that public learning at both individual and public instances must be a means to the solution of individual and societal problems.

Three questions are sufficiently fundamental for our attention at this stage. How can one approach the task of providing competence and effectiveness in teacher education through curriculum design? How can one generate a solid competence-based curriculum, taking into account all varieties of learning (e.g. information, attitude and skills), essential supportive prerequisite and the complexity of cultural values, politics and socio-economic realities as well as modernity that shape the construction of meaning and influence effective application in the classroom? To what extent should productive work, vocationalization, contextualization, collaboration classroom practice, inquiry, modernity drive teacher education?

There must surely be alternative ways of answering these questions and others by the curricularists. In this chapter, an attempt is made to propose and describe the procedure for deriving an eclectic, effective competence-based curriculum model which we believe to be worthwhile, feasible, responsive, timely and experimentable. It is essentially problem-centred, focusing on persistent professional

imperatives and contemporary challenges. The eclectic competence-based curriculum design process involves eleven major phases constructed of overlapping and interacting system, which allows for flexibility, inter-dependence, inter-relatedness of decisions and action, and contextualization.

These phases are:

- Situational Analysis (needs assessment);
- Job Description;
- Task Analysis;
- Course Objectives;
- Content Selection;
- Selection of Learning Experiences;
- Trial Testing and Formative Evaluation (peer review);
- Feedback Information for Further Improvement;
- Institutionalization;
- Evaluation (summative);
- Maintenance (sustainability).

Situational Analysis

It is logical to identify, analyze, diagnose and understand the context, terrain, milieu or the environment of the teacher education programme socially, politically, culturally, demographically, historically, ideologically, economically, legally and educationally. The curricularist must always bear in mind that the process of making decisions about what ought to be taught, experienced and evaluated is fraught with sub-texts and power politics as well as the economic and socio-cultural imperatives propelling the new thinking and orientation contextually.

Two of the major considerations at this stage are:

- Curriculum conceptualization and legitimization;
- The collection and analysis of relevant comprehensive data on resources, cultural values, power distribution, educational system, problems and challenges of the existing programme and global challenges.

The purpose of situational analysis is to collect basic information required for a meaningful curriculum building; identify tasks, problems and difficulties and seek possible alternative solutions. The professional analysis should be responsive research-oriented, humane in nature, democratic and clinical in approach, comprehensive in scope and diagnostic in effect. All the research methods available in all the fields of social science and education are relevant and the selection of research techniques and procedures must be carefully and rationally made on the

basis of terms of reference, time, scope, coverage, finance, personnel, professional excellence and need. The information required from the analysis of the situation has been described by Taba (1962); Nicholls and Nicholls (1972); Hawes (1979); Skilbeck (1976); Bishop (1985); Adegoke (1988), etc. These include: changes and trends in society, parental expectations and requirements, values and attitudes, resources for learning, school number and distribution, staffing, current legal provision, current curricular practice, social and cultural policy requirement, cognitive and language developments of the learner, training and retaining facilities for teachers' role, potentials of various agencies and institutions, and public debate. A situational analysis of the world of work is critical. This information can be gathered from the following major categories of sources:

- i. imperatives for professionalism and teaching profession;
- ii. library materials (i.e. reports, periodicals, pamphlets, books, theses and research reports);
- iii. reports of commissions and major curriculum conferences, reports of educational agencies, national policies on education, various provisions on development plans, public debate;
- iv. observation of existing practices, processes and products and relevant lessons elsewhere;
- v. globalization and internationalization.

It must be borne in mind that the stage of situation analysis is very demanding in terms of preparation, provision of support systems, monitoring personnel, equipment, coordination, information processing, synthesizing and general logistics.

Job Description

This stage involves function mapping and the process of assessing needs and defining competencies and effectiveness from the perspectives of the experts, the society, the learner and productive work imperatives. This stage provides a general functional framework. A job description explains the job as it is and suggests the special or unusual conditions associated with the competent and effective performance of the job and/or work.

The approaches which may be used in listing and describing the teaching job of a teacher include:

- Specifications in the national and international policies on teacher education;
- A personal account of activities, e.g. a daily narrative diary kept by the practicing professional or the use of user-encounter form over a fixed time period;
- Observation (i.e. of an individual professional records and activities carried out by someone else, using an observation guide and checklists;

- Expert judgement, which has traditionally been the major mechanism for identifying the professional behaviour;
- Societal needs and problems, i.e. the identification of the societal needs and the professional resource available to meet those needs;
- Relevant job or work statistics;
- Job or work records;
- Studying the natural history of job problems;
- Analysis of frequently used textbooks, journals, etc., in the training of teachers.

Task Analysis

This stage involves the detailed analysis of the competences, listing each competence and the comprehensive tasks/steps involved through systematic investigation, content analysis and concept mapping. It is also required at this stage to indicate the frequency of performance, with a view to determining critical skills. The steps involved in each task should also be listed in a sequential, logical and interactive order, bearing in mind contextualizations.

Based on the expansion of Lawless framework as quoted by Rowntree (1981), a framework for analyzing a task-based component in a curriculum has been presented by Adegoke (1989):

- What sort of problem and challenges are the competent and effective experts in the field interested in? What are the professional profiles?
- What are the specific tasks and sub-tasks involved in teaching?
- When should the task be carried out?
- What are the enabling contextual factors and skills required?
- What are the objects on which the task is carried out?
- How is the task carried out? What order is followed? How long does each step take?
- What are the most likely margins of errors?
- What are the criteria of capability?
- What are the criteria of competence and indicators of effectiveness?
- What kind of conceptual frameworks do the experts operate within the classroom and outside the classroom?
- How do they explain and justify their solutions?
- How much practice theory, must be built into training, subject mastery and pedagogy, etc.

Course Objectives

The fundamental question which a curricularist seeks to answer at this stage is: What kind of things should the trainee be able to understand and do at the end of the course that will most facilitate his becoming a competent and effective individual in the least amount of time? (Mager and Beech 1969:20).

The formulation of specific and detailed curriculum objectives which are appropriate to a given age range and social environment is a difficult, time-consuming, value-laden but useful exercise. The major sources from which objectives may be derived include the society, the nature of teaching, the nature of the profession and the trainee. The analysis of the particular culture and society should reveal the problems, needs, requirements and demands of that society. An insight into some critical societal needs must have been obtained during situation analysis. The analysis of the learner and of the learning process should reveal his needs for self-development, self-fulfilment, self-actualization and requirements for professional development. All the interest groups and agencies concerned with curriculum development and the labour market should be reasonably involved by means of well-coordinated public debates, conferences, seminars, review of available materials and existing situations, and memoranda. The statement of objectives should be precise, measurable, observable and presented in a form which makes them most helpful in selecting competence-learning experiences and evaluation techniques.

The other practical challenge at this stage is that of the need to classify the objectives with a view to ensuring taxonomic balance. Such taxonomic schemes are very useful as a device for ensuring balance, explicitness, a common and consistent focus and a comprehensive basis for the evaluation of knowledge, skills, attitudes, etc. Curriculum literature contains a number of useful guides for deriving behavioural objectives. One of such guides is that of Robert Mager (1962). Generally, the problems of writing the objectives of teacher education centre around coverage, balance, relevance, specificity, clarity, timeliness, sequence, responsiveness and professionalism.

Content Selection

Content refers to facts, concepts, principles, theories, generalizations and relevant aspects of social, emotional and attitudinal development. In a balanced competence, curriculum trainees have opportunities to develop competences in knowledge, skills and attitudes and to internalize and utilize them in ways that are appropriate for their professional, personal, social, cultural and intellectual needs. Both content and process are germane. The basic questions are: What knowledge, skills and attitudes are of the greatest worth in engendering competent and effective practice? What is the most profitable structure/order of presenting the tasks?

These two questions relate to proportionate selection and sequence. There should be a clearly defined set of criteria for the selection of content. Such criteria include significance, validity, professionalism, interest, utility, continuity, self-sufficiency, learnability, feasibility, globalization, modernity, comprehensiveness and consistency with socio-economic realities and learner's characteristics (e.g. maturity, readiness, motivation, etc). Total work practice should be arranged by considering logical sequencing, chronological sequencing, level of difficulty (from general to specific, from simple to complex, etc.) and copious opportunities for reflection and practice.

The major problem of selecting curriculum content lies in the selection of particular subject matters from the vast range of possible ones. Since one cannot teach or learn everything, one must select from the plethora of knowledge and civilizations. Some alternative answers to the questions of content selection in the process of curriculum development have been attempted by some writers (e.g. Phenix 1964; Skillbeck 1976; Taba 1962; Hirs, 1965; Tyler 1949; Wheeler 1971; Pring 1978) who suggested a set of criteria for content selection which may be considered together and listed as: contiguity, reinforcement, repetition, social utility, social responsibility, common cultures, cognitive concern, learnability, sequence, validity, structure of the subject, necessities, social pressure, basis for further education, opportunity for multiple learning activities, consideration of the aims, goals and objectives, consistency with social realities, flexibility, personal satisfaction, resources, integration and balance.

Selection of Learning Experiences

The critical question at this stage is: What training strategies and other educational materials will be required to make teacher education task-effective and enjoyable, bearing in mind that the varieties of learning are information, attitudes and skills? In view of the fact that the goal in this approach is to master the elements of work or job competence and technique effectively, mastery learning offers a powerful learning approach despite its limitations (Adegoke 1989). It is essential to expose trainees to critical inquiry, classroom practice, contextualization, collaboration, and continuous sustainability (Babalola 2010) through strategic and balanced section and offerings in teaching subjects, pedagogy, education studies, general studies and teaching practice, with full ICT integration.

It is the curriculum designer's task to select from among the various options: technique, strategies, methods and materials which seem most appropriate for the objectives, the needs of the trainee professionals and the constraints of the instructional situation and context. The selection and development of instructional strategies is one of the most critical and complex components of the process of curriculum design and implementation. The selection of an instructional strategy requires the consideration of several variables, viz: the size of the class, the nature of the subject area, the characteristics of the student audience, the availability and

accessibility of resources and materials, the quality and preferences of the teacher, the specified general goals and instructional objectives, and the teacher education context (i.e. professional, political, cultural, economic, ideological and social factors of the school and environment). The selection of instructional strategy is also often based more on designer's preference and expertise than on any other factor mentioned so far. It is problematic to state that one method is superior to another. It depends on the contextual circumstances. Practical approach is often plausible.

Weston and Cranton (1986) have attempted to describe teaching methods in four categories. These are:

1. instructor-centred;
2. interactive;
3. individualized;
4. experimental.

According to Adegoke (1989), it will be useful to consider the following when selecting learning experiences for competence education for trainees:

- choose the technique that most closely approximates the performance conditions called for by the objectives;
- choose the technique that causes the students to perform in a manner most closely approximating the competence called for on the job or in a work and the indicator of effectiveness;
- choose the technique that will bring about originality, knowledgeable ability, ingenuity, innovativeness, imaginativeness, inspiration, resourcefulness and communicativeness.

Evaluation of Teacher Education Programmes

Evaluation (both qualitative and quantitative paradigms) is an integral component of the teacher education programme and it is to ascertain its effectiveness, using a variety of techniques to look at a wide range of admission processes, teaching-learning processes, environmental factors, quality, motivation and dedication of trainees and trainers, quality of academic, professional and practical instructions, availability, adequacy, access, quality and use of resources, quality of examination process, quantity of teaching practice process, excellence in socialization, graduation, induction process, absorption, developmental efforts, professional ethics, integration of ICT, transformativeness, creativeness and reflectiveness. There is the need for strategic self-evaluation, peer review, programme and institutional accreditation, employers' feedback, etc.

Conclusion

Motivation is central to a competence-based education. We need competent teachers who are organizers, facilitators, motivators, innovators and inspirers, without necessarily controlling the learners' thinking. Learners must be viewed as capable of learning by treating them fairly and equitably, and engaging them in equity-based pedagogical practices. Most importantly, creative, reflective, transformative and effective teachers will produce creative learners who may be described as intelligent, aware, flexible, innovative, responsive, original, inspiring, fluent, questioning, non-conforming, humorous and self-reliant.

Teachers need to know how to conduct action research, interpret and use such research reports to address concerns about the educational quality of students, curricular experiences and pedagogical conditions, if competence-education and effectiveness are the ultimate goals in teacher education.

Most effective teachers engage in informal action research in their own classrooms from day to day. Each day, they observe the responses of learners to each other, to the teachers' methods and to work problems. This, no matter how informal, is essential in the improvement of the curriculum and instruction. By practice, teachers can refine such methods to the point at which they yield good results quickly and competently.

In this era of globalization and information communication technology, a competence-based curriculum demands a technology-based approach (e.g. e-curriculum, e-teaching, e-learning), a new competence examination focus, a responsible implementation culture and very inspiring and highly motivated students.

While a competence-based curriculum must be culturally relevant to be meaningful, the strategies to be adopted must be experientially appropriate for students to take responsibility for their own learning. The need therefore arises for the modification and shifting of teaching strategies to match students' learning styles, norms, practices and other contextualizations. This required paradigm shift entails a movement away from the traditional teaching to problem-solving, from rigid classroom instruction to the use of the entire environment as a resource, from teacher-based to learner-centred, from mere certificationism to certified functionalism, and from lip service to genuine, honest and pragmatic service (Adegoke 1999: 10).

Any model is as good as the people who operate it. The strength or weakness of any model is invariably contextual. There can hardly be only one best model for teacher education because of certain fundamental variations like conceptions, perceptions, power and authority, value systems, economic considerations, technical know-how, the nature of the educational system, etc. Programmes that may be regarded as outstanding vary in structural and conceptual formats.

Questions about which types of teacher education programmes produce teachers who are best at causing their students to learn have hardly been addressed holistically, let alone answered. For obvious and hidden reasons, the criticism of teacher education will ever remain a recurring theme. Teacher educators' curriculum theorists and other stakeholders should see it as one of their sources of inspiration and exploit it for further enhancement of teacher preparation. We should develop our capacities and those of our prospective teachers for competence, innovation, spontaneity, perception, reflection, intuition, creativity, collaboration, self-improvement, professional distinctiveness, dignity, confidence, knowledgeability, dedication, commitment, efficiency and effectiveness.

One may wonder if a theoretical curriculum framework can remain so if it consistently runs counter to practice, at least in emphasis. This raises the issue relating to the esoteric nature of scientific theory in general and the intuitive, prudential and moral nature of curriculum theorizing, which is essentially normative and praxiological. Certainly, without theorizing, curricularists would remain ignorant of the complexities involved. But the theory needs to be supported by frequent trips to the real curriculum world if it is to have the much required practical value, and if scepticism, conflict and confusion between theory and practice are to be avoided. Education has a vital role to play in solving individual and societal problems. An eclectic, holistic and effective competence-based teacher education becomes imperative if the future generations are to be empowered to learn to know, to be and to live together. To ignore this is to ignore worthwhile teacher education.

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17

Entrepreneurship in Teacher Education: Issues, Trends and Prospects

Victor B. Owhotu

Introduction

In this chapter, the concepts of entrepreneurship, the entrepreneurial teacher and teacher entrepreneur are the focal issues that will be discussed in relation to the contexts of public and private school systems and national development. Ample examples and excerpts from relevant literature will be presented for maximum clarity.

The Kauffman Report (2006) on the American entrepreneurship curriculum provides a very useful definition of the nature and goals of entrepreneurship and entrepreneurship education:

Entrepreneurship is the transformation of an innovation into a sustainable enterprise that generates value. An entrepreneur is 'any entity, new or existing, that provides a new product or service or that develops and uses new methods to produce or deliver existing goods and services at lower cost'. Entrepreneurs innovate new ways of manipulating nature, and new ways of assembling and coordinating people... The innovator shows that a product, a process, or a mode of organization can be efficient and profitable, and that elevates the entire economy. Entrepreneurs take risks to develop a novel, sustainable enterprise – a new or improved product, service, or mode of organization that can exist independent of its originator – that benefits the economy and society (Kauffman Panel 2006).

The defining trait of entrepreneurship is the creation of a novel enterprise that the market is willing to adopt. Hence, entrepreneurship entails the commercialization or its functional equivalent) of an innovation. New ideas,

products, or organizational schemes matter little until they achieve concrete reality in the marketplace – that is, until they are actually used. The market judges utility and need along with excellence. It does not value – and does not need to value – every good idea. The entrepreneur’s risk, therefore, is not a gamble but an informed calculation about the viability of the new enterprise in the market, about its capacity to meet a demand or need or others.

Divine 88 has also rightly observed that the need for entrepreneurship across the curriculum is very much under-emphasized and suggests that all students or learners across the different levels of education should be exposed to it: ‘It is not out of place to say that many business ideas emerge from non-business disciplines but are often waved aside or ignored because students are not sufficiently educated in the knowledge and skills’.

This statement is particularly important because the concept of entrepreneurship emphasizes the human spirit, attitudes, motivation and visions, skills and abilities that are universal and, therefore, applicable to all areas of human endeavour and disciplines. Whereas the term entrepreneur connotes contexts of socio-economic, industrial and technological development, as distinct from the humanistic contexts of teaching and learning, human qualities, entrepreneurial opportunities of demand and supply, market forces, needs and their satisfaction, also characterize the albeit conservative, traditional context of formal education systems. The most urgent demand on/expectation of education systems all over the world is to satisfy the existing and emerging socio-economic manpower gaps in business, industry and the vocations or professions for children, youths and young adults in the formal and non-formal contexts of learning. The entrepreneurial spirit, spurts of vision, creativity, foresight, innovation and informed risk-taking are the critical factors in entrepreneurship which often inform the design of appropriate goals and strategies for attaining them. For instance, this is the whole point about Goals 3 and 4 of the Education for All Dakar Framework for Action, which clearly focused on the needs of relevant target groups of children, youths and adults who make up the largest force of very inquiring, creative and innovative minds and unlocked energies.

The critical issue of innovation in entrepreneurship is in terms of new products, new production methods, new markets and new forms of organization: ‘Wealth is created when such innovation results in new demand (www.quickmba.com). In other words, the twinning of innovation and entrepreneurship determines the competitive advantage that globalization demands of any product, service, business process or education system.

Entrepreneurship Education and Education Entrepreneurs

Wikipedia, the online encyclopaedia, provides the following as the objective of entrepreneurship education:

... to provide students with the knowledge, skills and motivation to encourage entrepreneurial success in a variety of settings. Variations of entrepreneurship education are offered at all levels of schooling (...). What makes entrepreneurship education distinctive is its focus on realization of opportunity whose management education is focused on the best way to operate existing hierarchies.

Entrepreneurship in education has received increased emphasis in the last decade – from basic and post-basic education to tertiary non-formal and special needs education – as a clear demonstration of political will.

In this regard, the Nigerian government in 2006 adopted a top-down approach to develop the entrepreneurial spirit through education when it directed the National Universities Commission (NUC) to include entrepreneurship education as a compulsory course in the higher education curriculum. The reasons are obvious. Whereas Nigerians are known to be part of the most enterprising people on the African continent, entrepreneurial activities have mainly been in the hands of the private and large informal sector operators. Furthermore, the considerable success of the informal sector, in terms of economic return, has proved to be a powerful attraction to a very large number of children and young people who would rather avoid the tedium of basic and secondary education, and would eventually drop out of school. Consequently, the government's mainstreaming initiative – known as entrepreneurship education (EEd) – aims to inculcate in all trainees the ability to:

- identify and solve problems, using critical and creative thinking;
- work effectively with others as proactive team members and cultivate the ability to resolve conflict;
- organize and manage oneself and one's activities;
- collect, analyze, organize and critically evaluate information to make decisions that must be carried through;
- communicate and negotiate effectively;
- reflect on experiences and explore various strategies for effective learning – learning to learn at all times;
- become curious leading to readiness to experiment and innovate (being never satisfied with the status quo); and
- consider self-employment as a viable option upon graduation from their institution.

Support for Entrepreneurship Education and Training

In recognition of the political will and initiatives of the government, international partners have recently provided support for entrepreneurship education and training. For instance, Hewlett-Packard, in partnership with the United Nations Industrial Development Organization (UNIDO) has launched GET IT training centres in Africa, including two centres in Nigeria located at the University of Uyo and the Africa Leadership Forum, Ota, Ogun State respectively. The GET IT programme is appropriately targeted at 'unemployed youth and graduates between the ages of 16 and 25 and helps potential entrepreneurs acquire IT skills with the aim of becoming better placed to create and run their own businesses'. (www.uni.unienna.org/unis). The strong emphasis of the policy is on the largest potential group of present and future labour force and leaders that need to be harnessed within the formal and non-formal education system. The teacher education factor is equally critical in every context of learning.

Against the backdrop of the crucial importance of employment generation and self-employment through entrepreneurship education, the National Youth Entrepreneurship Summit lays great emphasis on entrepreneurial development as a crucial strategy for investing out of poverty, youth unemployment and the attendant social crises. Accordingly, this informs the mission statement of the (Nigerian) National Youth Entrepreneurship Summit (2008):

To create sustainable and productive livelihoods for 1 million young people by the year 2020, with emphasis on using locally available resources to institute partnership, policy change in favour of youth participation and adoption of technologies that foster economic and social development.

In summary, the worth of entrepreneurship education as part of reinforcing the existing national and global frameworks, lies in the well acknowledged facts that: 1) entrepreneurship is a key driver of the economy; 2) entrepreneurship education is a lifelong learning process; and, 3) it focuses on 'developing understanding and capacity for pursuit of entrepreneurship behaviours skills and attributes in widely different contexts' (Divine 88).

The following excerpts, therefore, provide some clear insights into the factors that must drive and sustain the implementation of the respective provision of Nigeria's Roadmap for the Education Sector and Nigeria's National Standards for Entrepreneurship Education.

Entrepreneurship as a key driver of the economy asserts that:

Wealth and a high majority of jobs are created by small businesses started by entrepreneurially-minded individuals, many of whom go on to create big businesses. People exposed to entrepreneurship frequently express that they

have more opportunity to exercise creative freedoms, higher self-esteem and an overall greater sense of control over their own lives. As a result, many experienced business people, political leaders, economists and educators believe that fostering a robust entrepreneurial culture will maximize individual and collective economic and social success on a local national and global scale (Divine 88).

Entrepreneurship education, as a lifelong learning process, starts at elementary school and progresses through all levels of education, including adult education. The standards and their supporting performance indicators are a framework for teachers to use in building appropriate objectives, learning activities and assessments for their target audience. Using this framework, students will have progressively more challenging educational activities, experiences that will enable them to develop the insight needed to discover and create entrepreneurial opportunities and the expertise to successfully start and manage their own businesses to take advantage of these opportunities (Divine 88).

Competencies such as entrepreneurial skills and creativity will be crucial in an economy that needs to be enriched by more adaptive and innovative education and training system (Hugonnier 2009:12).

A Global Perspective of Teachers as Entrepreneurs: New Mandate and Trends

The communiqué of the 2009 World Conference on Higher Education (WCHE) re-emphasizes the serious gaps in teacher supply or availability and its implications for fulfilling the mandate of higher education to drive qualitative and inclusive reform and sustainable development at all levels.

Higher education, especially teacher education and training, has been a focal point of development within the national, regional and global Plans of Action since the World Conference on Higher Education in 1998 and subsequent ones, including the 2009 edition. The implications are clear for the welfare of nations in the face of global challenges and competition.

Higher education is strategic for all education and the basis for research innovation and creativity (for nation building and national development). At no time in human history has the welfare of nations depended in such a direct manner on the quality and outreach of their higher education systems and institution (UNESCO 2009).

Furthermore, the emphasis, especially for Africa, is not only one of access, but of social responsibility of higher education to discharge its renewed mandate as the driver of qualitative reform through a comprehensive transformation of its

traditional structure, organizational profile and core mission of teaching, learning, research and development, and service. Specifically, the 2009 WCHE reiterated the following critical needs of African universities:

- Special focus on the challenges and opportunities for the revitalization of higher education in Africa – an important tool for the development of the continent;
- How to effectively confront emerging challenges relating to gender and racial inequality, academic freedom, brain drain and the lack of graduates' preparedness for the labour market;
- The urgent adoption of new dynamics in African higher education that work towards a comprehensive transformation to sharply enhance its relevance and responsiveness to the political, social and economic realities of African countries.

The issue of teachers as entrepreneurs first needs some clarification; a teacher imparting knowledge and skills as a course component within a programme may not necessarily be a practicing or successful entrepreneur in his order or own right. The State of Maryland (USA) Policy Report presents interesting perspectives on the entrepreneurial teacher: 'What would he or she look like? Who, generally, is considered to be an education entrepreneur?' The Maryland Policy Institute states that: 'Education entrepreneurs are individuals who develop new approaches to tackle society's greatest challenges in radically new ways. They are driving the most compelling improvements in educational outcomes for chronically underserved students'. More importantly, it affirms that education entrepreneurs have indeed created successful ventures such as: Teach for America, Challenge Summit, New Leaders for New Schools, The New Teacher Project and the Knowledge is Power Programme (KIPP), and that, 'the leaders of these organizations have transformed education for thousands of children and have changed our very ideas about what is possible in public schools... All of these initiatives have looked outside the traditional public schools for sources of new ideas, talent and school management' (Maryland Policy Institute 2009).

Furthermore, the profile of teacher entrepreneurship in the Maryland school system revolves around whatever rights teachers could claim, negotiate, enforce or outsource. Several factors, such as unionism, specialization, class size, merit pay, differentiated pay, retirement plans and political activity are steps that could be taken to 'provide teachers with the freedom to be entrepreneurs' (Maryland Policy Institute 2009:5).

However, for the purpose of this discussion and against the backdrop of the trend in developing countries, what is emphasized here is the social entrepreneurship perspective rather than the business entrepreneurship dimension which the second profile of the Maryland schools illustrates.

Who, then, are social entrepreneurs and education social entrepreneurs? The teacher as social entrepreneur ‘recognizes a social problem and uses entrepreneurial principles to organize, create and manage a venture to make social change (rather than to make a fortune or money). The main aim of social entrepreneurship as well as a social enterprise is to further social and environmental goals for a good cause (often based on a progressive business model). Whereas a business entrepreneur typically measures performance in profit and return, a social entrepreneur assesses success in terms of the impact he/she has on society as well as in profit and return’ (Wikipedia).

A third dimension is the potential scenarios of teacher entrepreneurship based on the economics of school systems that may well represent untapped opportunities that professional teachers could explore and become part-time entrepreneurs. Hurley (2010) draws the attention of conservative, hardworking and effective teachers to the need to explore their environment and put themselves first for a change, because they deserve to maximize their output by leveraging their social entrepreneurial potential:

You encouraged, taught and showed them exactly what it takes to learn and to be the best they can be. But now it’s your turn – time to put yourself first and start on your journey to do what’s right for you; time to finally begin your entrepreneurial dream of starting your own business or perhaps adding a supplementary income to your teacher’s salary; time to do something – just for you. And with summer right around the corner, the timing couldn’t be better. Parents will spend over \$4 billion nationwide this year on academic tutoring, with a predicted growth of 12 to 15 per cent a year. You can see that now is the perfect time for teachers and others to consider starting their own home-based business in the hot educational industry (Laurie Hurley:/www.hometutoringbusiness.com).

Furthermore, a graphic picture of the scale of private tutoring is presented by Bray (2007:17) for selected countries, involving millions of children and billions of dollars spent per annum in what he calls ‘the shadow education system’:

Private supplementary education exists because the mainstream education exists... as the size and shape of the mainstream system change, so do the size and shape of supplementary tutoring... In almost all societies, much more public attention focuses on the mainstream than on its shadow ... the features of the shadow system is much less distinct than those of the mainstream system.

The huge scale of private tutoring in developing countries is shown as follows for public schools: Brazil, 50 per cent; Egypt, 65 per cent of urban primary children and 53 per cent of rural ones as at 1994. In 1993, Hong Kong had 41 per cent of Grade 3 and 39 per cent of Grade 6; Japan had 24 per cent of

elementary and 60 per cent of secondary; and nearly 70 per cent of all had received tutoring by the time they had completed middle school. In Mauritius – a country that has attained the six EFA goals, 78 per cent of Grade 6 learners take extra lessons, while 98 per cent in Forms 3 and 4 and 100 per cent in Forms 5 and 6 had tutoring. In 1996, Tanzania had 70 per cent of Grade 6 pupils in selected urban and rural schools, 70 per cent of Grade 6 pupils in selected urban and rural schools, and 70 per cent of Grade 6 in a Tanzanian school. In 1995, Zimbabwe had between 36 per cent and 74 per cent of children taking extra lessons (Bray 2007).

The volume of cash spent by Japanese parents on tutoring is put, as at 1997, at \$14 million; \$200 million for Singapore; 20 per cent of total household expenditure per child in urban Egypt in 1994; and \$25,000 million in Republic of Korea during 1996 – which was ‘equivalent to 150 per cent of the government’s budget’. In other words, such a highly lucrative shadow industry – which is more or less a cross between social entrepreneurship and business entrepreneurship – has underscored the current challenge of meeting the insatiable demand for tutorial support. This translates to a huge monopoly of a minute per centage of entrepreneurial school curriculum subject teachers and agencies. Where there is such a huge demand and low supply gap, social entrepreneurship may easily be interchangeable, with economic entrepreneurship involving extrinsically motivated teachers and education service providers.

Several crucial questions arise: What is the difference between entrepreneurship as defined and moonlighting, divided loyalty, and breach of professional ethics? Are class teachers who give tutorials for a fee after school hours to learners who are also their students at the same school during school hours culpable? At what degree of disadvantage do they put the other learners who do not attend their lessons? The moral issue of such a large-scale practice is that such teachers may not be rendering good and essential service in the social entrepreneurial sense defined earlier, but a clear case of professional misconduct: ‘robbing Peter to pay Paul’, as it were. Whereas in most education environments in developing countries, the cost of tutorial support for school children has been estimated to constitute a parallel industry or economy, moonlighting by teachers in public employment is regarded as unprofessional, unlike the academic lawyer or doctor in public institutions.

Jayachandran (2008) raises core issues of equity, social justice and professional ethics that such entrepreneurial services generate:

On the one hand, wealthier families or those who put a higher value on education compared to a scenario where all education is publicly funded. On the other hand, tutoring might be most helpful for the weakest students, enabling them to catch up with their peers. Even if tutoring increases inequality,

the popularity of tutoring suggests that the demand for education is not being adequately met by public schools; so, greater inequality might be the price to pay for greater choice and efficiency in the market of education.

Perhaps more critical is the finding that ‘when teachers offer for-profit tutoring, they teach less during the regular school day, causing students to do worse on the national secondary school exam. Tutoring increases inequality in test scores among classmates. In this context, banning teachers from tutoring their own students or reducing entry barriers for third-party tutors could increase student achievement. No one expects that freelance teaching will ever come to dominate the profession (Applebone 1995).

Entrepreneurship in the teaching and learning environment in developing countries presents another interesting perspective, and the question that needs considering is: What type of entrepreneurship education should initial teacher education curriculum contain – the social entrepreneurship or the business entrepreneurial education? What would be the end purpose of teaching the course? To encourage would-be-teachers to avoid the constant stress and sacrifice of the classroom for which they are being prepared? What are the attendant risks in terms of braindrain and potential turnover among qualified teachers who practice in difficult economic and professional environments, especially in developing countries? What are the contents of entrepreneurial education and how does entrepreneurship show itself in paradigms of education? (Remes 2000). The answers to the first three questions seem fairly obvious, against the backdrop of low status, poor motivation, poor remuneration, increasing personal and family commitments and responsibilities and cost of living. Most teachers’ would naturally choose the business entrepreneurial option to survive.

Perhaps of more practical relevance are the contents of entrepreneurship education curriculum through which the teacher entrepreneur is made. In the European, American and Nigerian education systems, entrepreneurship is a core subject at different levels. In the United States, elements of entrepreneurship education are strongly entrenched in the syllabi of secondary education and the majority of higher schools offer compulsory or optimal courses in entrepreneurship (Wach 2010).

The European Union has developed a policy to promote entrepreneurship in basic schools, secondary and post-secondary institutions although it is an optional course in universities. Furthermore, the European Union, within the framework of OECD and the Community Lisbon Programme, urges that the ‘curriculum for all level of education should include, directly, entrepreneurship as the aim of education; therefore, all educational institutions should integrate entrepreneurship into their curriculum, especially in technical and hard sciences majors’ (Wach 2010).

Table 17.1: Theoretical Framework of Entrepreneurial Content

	Behaviourism	Cognitive Thinking	Constructivism	Post-modernism
Learning ways	Entrepreneurship from the environment, teaching facts of business and entrepreneurship	Processing facts towards evaluation gained from the environment (e.g. ethical solutions in different business)	Building one's knowledge in entrepreneurship (portfolios of one's business knowledge also into net- environments)	Creating one's own business and practicing it, e.g. making products and markets for them, mainly in schools but also outside-learning environments

Source: Remes 2000

The point about technical and vocational education and training has been made elsewhere (Owhotu 2008) in terms of the high potential for self-employment and employment generation, especially for the youth, and teacher education also has a critical role in this regard. Nigeria's score-card in technical vocational education is impressive and attests to the considerable strides that the National Board for Technical Education (NBTE) has made in the last couple of years.

In this regard, The African Union Fourth Ordinary Session of the Conference of Ministers of Education (COMED AFTV) observes as follows:

The Third Conference of Ministers of education held on 17-20 March, 2009, acknowledged the tremendous improvement in the Nigerian TVET delivery as a result of eight years collaboration (since 2001) with UNESCO on development of about 57 TVET modules that will adequately equip students with employable skills and with cognitive skills for further studies. The Ministers also charged UNESCO with the responsibility of replicating the Nigerian experience in other countries of the region (African Union 2009:10).

The implications for youth engagement, employment and employment generation through the TVET-entrepreneurship orientation are also clearly reiterated by the ECOWAS programme, which seeks to place TVET at the centre of access at all levels of the educational system, to strengthen the training capacities of TVET and to 'forestall the current desperate attempt being made by youths and their parents for employment' (p. 12).

The focus of entrepreneurship in general teacher education is more on capacity building, awareness creation, general knowledge and skills orientation rather than on a specialization in the economic and management sciences that would be teachable and practiced by teachers across the subject curriculum. However, teachers who participate in general training programmes are usually expected to be able to 'apply the skills and knowledge... to venture-related decision making, including how to raise finance, the legal and tax framework, marketing and recruitment' (Lee and Wong 2001:1).

It is, therefore, assumed that greater understanding and effectiveness of teachers would be more likely achieved if the same teachers had been exposed to entrepreneurship education much earlier, e.g. during their primary and secondary school education, as is the case in Poland.

A typical entrepreneurship education syllabus which is compulsory in schools in Poland provides the first building blocks that class teachers and students who take teacher education options later on should find a useful preparation (Wach 2008).

Table 17.2: Entrepreneurship Education Syllabus in Secondary Schools in Poland

Education Aims:	Active and conscious participation in economic sphere. Moulding the ability in team working. Moulding entrepreneurial attitudes. Developing the interest in running own business.
Education Content	Entrepreneurial attitude and personality. Team working. Profit and risk. Professional and economic activities. Market and market economy. Economic growth and its measures. Stock exchange. Household. Polish system of Insurances. Enterprise – its forms and role in the economy. Costs and incomes of enterprises. Investing and financing. Money and banks. Procedure of setting up a firm. Employing employers. Labour market and unemployment. Economic globalization. Foreign trade. Business ethics.
Education effects:	Ability for team working and negotiating. Distinguishing between different forms of investing. Ability for predicting and forecasting the profitability of economic ventures. Identification of basic forms of enterprises. Preparing documents for setting up own business. Preparing basic tax documents.
School tasks:	Help in developing the interesting running of own business. Supporting pupils in gaining the knowledge and skills for entrepreneurship. Supporting pupils in choosing the future career.

Source: www.upm.ro/proiecte/EEE/Comnferences/papers/S605.pdf)

The situation of entrepreneurship education in sub-Saharan Africa is graphically reflected by Kabongo's 2008 study, which shows that entrepreneurship education in tertiary education is marginalized and does not constitute a force in business programmes. Of the 57 institutions studied, 50 per cent offer a course dedicated to the topic of small business scale management. Of these, 14 per cent offer a combined course titled 'Entrepreneurship and Small Business Management'. The descriptions and titles of courses demonstrate that entrepreneurship, or a part of it, is taught or at least encouraged in the majority of colleges and universities offering business administration in sub-Saharan countries. However, one thing was consistent in the data. The majority of schools offering a course in entrepreneurship/small business management do not require the course for the completion of the business programme, with exception of students specializing in entrepreneurship. Looking at the remaining courses offered in the area of entrepreneurship, the results indicate that 21 per cent of the institutions studied list a course in investment analysis, 19 per cent in project management, and 12 per cent in venture capital and leadership development. Of the 57 colleges and universities studied, only 10 per cent offer a course in innovation and technology,

9 per cent offer a course in brand management, and 5 per cent offer a course in business planning/growth and creativity management. However, based on both course titles and course descriptions, courses with leadership and innovation or some close variant are treated as regular entrepreneurship courses without much emphasis on leadership or innovation (Kabongo 2008).

We have earlier in this chapter presented the political will of the Nigerian government in introducing the compulsory course on entrepreneurship education in Nigerian universities. In this regard, the University of Lagos entrepreneurship core courses – General Studies (GST 307 and GST 308) – are coordinated by the Centre for Entrepreneurship and Corporate Governance and taught by selected tutors with business and management expertise drawn from the relevant faculties of the university. The contents are approved by the Senate of the university in collaboration with a representative of business and industry who also chairs the Centre's Management Board. It is designed to inculcate in every degree-level student the values and skills that make for a balanced would-be and future entrepreneur: sound work ethics, integrity and business ethics; corporate accountability and transparency; corporate social responsibility (to society) to be efficient, effective and economic in the use of resources (CECG 2002).

The current revised syllabus/course contents are in modules written by the tutors.

1st Semester

- A1: Module 1: Knowing Your Business Environment
- A2: Module 1: Starting Your Own Business
- A3: Module 1: Managing Your Own Business
- A4: Module 4: Financing Your Own Business
- A5: Module 5: Corporate Governance

2nd Semester: Setting up a Business Venture in a Discipline

These optional courses are in various disciplines. In addition to a compulsory requirement for group preparation for Writing a Business Plan, the discipline-based options in the second semester are:

- B1: Business Venture in Health Services
- B2: Business Venture in Legal Services
- B3: Business Venture in Industrial Services
- B4: Business Venture in Engineering Services
- B5: Business Venture in Building Services
- B7: Business Venture in Information & Communication Technology Services
- B8: Business Venture in Educational Services.

The entrepreneurial awareness creation, the innovative and bankable ideas generated, and the incubation strategy and venture portfolio creation are expected to equip every undergraduate with the attitudes and skills to become an entrepreneur.

Recalling that Objective 8 of the Nigerian Entrepreneurship Education Programme (EEEd) – a general entrepreneurial capacity building – is to consider self-employment of students as a viable option upon graduation from their institution, a conservative reaction to option B8 above from a good number of teacher educators would likely be that the teachers they are training would more likely choose, at best, the business entrepreneurship or educational service track upon graduating rather than take up classroom practice in the public or private institutions. While there may be a dearth of qualified teachers as is often reported, there might well be no lack of qualified teachers but teachers who are not motivated, who lack job satisfaction due to the prevailing unconducive environment – economic and professional – in which they work. If graduates opt to remain in the public or private school system, then it is expected that professional ethics should drive their involvement in private tutoring services or offer private tutoring at home, or run such tutoring ventures subject to the regulations governing their full-time employment. Academic medical doctors in university teaching hospitals and public research institutions and law teachers in the university system have succeeded, after some protracted negotiations with their employers, to use private practice or consultancy as a necessary element of social entrepreneurship that adds value to and enhances their core functions of teaching, research and service to the community. However, can school teachers' unions argue for the same margin of strategic flexibility with their employers? Probably not; but depending on prevailing economic realities, nothing stops dedicated classroom teachers from augmenting their income through small-scale to medium-scale involvement or engagement in social entrepreneurship with satisfactory levels of income to enable them to meet the myriad of needs and attain a sustainable life style. Such part-time activities or opportunities in educational entrepreneurship can be located in primary, post-basic and post-secondary institutions, as part of the institutions' business ventures or social entrepreneurship curriculum. For example, the South African Institute for Entrepreneurship is a good case study of how institutional and professional interests can be carefully harmonized into a win-win situation. The experiential training has been found to enrich both teachers and learners and prepare them for life after school, as the following excerpts illustrate:

- The project follows an example of good practice in enterprise development by supporting the teaching of entrepreneurship skills in school through training teachers and providing support materials that allow for experiential learning. Studies in South Africa for Global Entrepreneurship Monitor have identified education and training as the key factor limiting the growth of entrepreneurialism, including the fact that 'schools are not providing

adequate instruction in entrepreneurship and economic principles, nor encouraging creativity, self-sufficiency and personal initiative' (GEM Report 2004).

- Using creative simulation, the programme targets this need by enabling participants to discover the ideas within themselves.
- An investment of R81 072.83 will provide the Business Ventures programme materials for Grades 5 and 7, and provide educator training to 20 educators in five primary schools in the Eastern Cape Province. Expected life change:
 - 20 educators will receive accredited training that equips them to take learners through the Economic and Management Sciences curriculum in these grades with confidence, while teaching meaningful entrepreneurial skills.
 - Over a three-year period during which the Business Ventures resource kits remain in good condition, a total of 1,200 learners will benefit directly from the programme and be better equipped to start their own business one day.
- Direct life change at R66, 46 per person.
- The project has the potential to make a lasting contribution to the development of entrepreneurialism amongst learners and, eventually, to the economic growth of the region (SASIX 2010).

The South African experience seems to offer a viable and sustainable set of conditions for building conducive environments for educational entrepreneurship to incubate, thrive and have the desired impact on the individual participants, the wider community and national development. The challenges are multifaceted, even for education systems that have long adopted the entrepreneurship education right from primary school due to conservatism, structural inflexibility and the primary focus of examination-centred curricula. Hess and Hassel (2010), for example, identify some of the challenges of conservatism and stiff policy environment that threaten the emerging entrepreneurial education imperative: 'the unmanageability of school systems, the lack of rewards and recognition for excellence (including the absence of monetary rewards for entrepreneurial success and the lack of prestige associated with education); lack of ready sources of venture funding for promising ideas and individuals ... the limited autonomy afforded to public education institutions'.

What then is the future of educational entrepreneurship and entrepreneurial ventures in view of the social entrepreneurial vocation that education as public good number one should pursue and that teacher education should deliver? The answer(s) must emerge from the prevailing and emerging models of education

in relation to social needs and national economic and technical-vocational imperative that should ensure a smooth transit point for children, youth and young adults to the world of work, self-employment and employment creation (Owhotu 2008). In other words, the demand side of social, economic and industrial framework or environment should dictate the supply profile of educational institutions to prepare learners or students to meet the skill gaps which are often very glaring in developing countries, especially in sub-Saharan Africa. Education systems will continually be the focal point for training teachers to teach entrepreneurship and entrepreneurial skills and knowledge, and for preparing learners to make a difference in this regard.

An important need at this point in the global trends is for scholars to carry out national situation analysis and impact studies of entrepreneurship education. There is no doubt that it has, like ICT, become the global imperative of the 21st century and will more likely grow exponentially in the years to come.

Lee and Wong (2004) predict the emergence of 'a highly tumultuous economy that pressurizes government policy makers to increase the current stock of businesses:

Job seekers too are not spared from this potential change. Flexibility and innovativeness will be critical survival skills in the highly competitive job market. Hence, it is vital that societies are encouraged to pursue entrepreneurial careers, and what is even more crucial is for universities and institutions of higher learning to provide courses and support to these potential entrepreneurs.

Conclusion

In this chapter, an overview of issues, perspectives and trends of entrepreneurship education has been discussed, drawing a number of insightful illustrations from the literature and trends in some regions of the world, including sub-Saharan Africa. The challenges facing formal education at all levels have provided the entrepreneurship teacher in the public and private sectors with a gold mine of opportunities to provide tutorial and other educational services without necessarily facing issues of professional misconduct or unethical practice, if he or she is in paid employment. Entrepreneurship or entrepreneurship education is the driving force of youth employment and employment generation, wealth creation and poverty reduction. The next step for African countries is to pay more than lip service to this urgent need and ensure its integration as a compulsory programme at all levels and contexts of learning. Global frameworks such as Education for All and the Millennium Declaration/Development goals have the least chance of being achieved by 2015 in most African countries. The implications for the children, youth, young adults and other target groups are telling. Sub-Saharan Africa has a

poverty rate exceeding 70 per cent and the highest rate of unemployment at 9.1 per cent hits the young people the hardest. The World Bank Info Dev Business Incubator Network in Africa provides examples of best practices that education institutions should share, as well as avenues for small business programme support for disadvantaged groups, such as women and young people. Since the emphasis is on support for small business enterprises, education systems can easily scale up the often theoretical entrepreneurship education programmes to the contexts of the real world of business. Furthermore, business incubators in Africa 'provide support for small enterprises to overcome business skills, infrastructure, market linkage, financing and «people connectivity» constraints, and expose entrepreneurs to information and communication technologies (ICTs) that help increase the productivity and market reach of enterprises across sectors' (InfoDev/World Bank).

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18

Integrated Pedagogical Approaches for a Productive Teacher Education

Cecilia Olubunmi Oladapo

Introduction

The context of teacher education and the roles of teachers require ever-increasing flexibility. This flexibility encompasses all areas of curriculum development, implementation and evaluation. Teaching is a challenge that requires long hours of work and preparation and, above all, skill in planning and in the classroom (Moore 2001). Thus, inadequate teacher preparation programmes result in the majority of teachers' inability to demonstrate adequate knowledge and understanding of the structure, function and the development of their disciplines. Therefore, an effective teacher education programme is a prerequisite for a reliable education, which leads to a good level of confidence for both the teachers and their students consequent upon which learning is coordinated effectively and professionally, while problems inherent in the teacher education are rectified and solved. A productive teacher can be professionally described as an effective and skillful teacher that influences learners to learn at their own pace (Muijs and Reynolds 2001). Pedagogy is very crucial to teacher education development in every nation. Teacher education is very germane to the technological development of every nation and, without proper methodology, professionals will not be able to positively interpret new development in the field of education. To achieve this, a paradigm shift from the traditional 'transmission' approach to one which is more complex, interactive and evolving is required (Muijs and Reynolds 2001).

Productive teacher education has to do with a range of different jobs, namely: develop the potential of student teachers; serve as role models to them; help transform education and through it society; and, encourage self-confidence and creativity. To achieve all these, Oladapo (2007) in her study discovered that

instructors that are flexible in choosing the approach to use for teaching achieve better than those that are rigid on a teaching approach. The study also indicates that teachers' emotional relationship with learners also plays a significant role in determining teaching/learning effectiveness.

Buttressing this view, Akinpelu (2002) posits that instructors can only achieve better effectiveness in teaching/learning activities when they make learning democratic and relate with learners positively and emotionally. Thus, there is need for improved and integrated approaches that would empower student teachers to develop appropriate attitudes to their job. However, for better training of teachers and meaningful productivity, there are four principal areas that need to be addressed. These are: improving the general educational background of the student teachers; improving their knowledge and understanding of the subjects they are to teach; understanding children and learning; and, developing practical skills and competencies. Even though all these are supposed to be holistically emphasized in the curriculum of the student teachers, the student teachers are drilled more in the subject matter than the methods.

Effective teacher education needs diverse repertoires that are not restricted to a few practices; as against the earlier argument intended to prove the superiority of one approach over another – for example, inductive versus deductive teaching or the lecture approach versus discussion approach. Apart from the fact that the result of all these debates was inconsistent, they were futile and misdirected because no one approach was found to be consistently superior to any other. Training of teachers in universities and colleges of education must be balanced because teachers' productivity will depend on their training background as student teachers. All these requirements are interwoven and must be taken as a composite whole. The pedagogy must be proportionately balanced with the teaching subjects, practical skills and emotional competence. Student teachers need to be adequately exposed to this professional preparatory training. This then calls for an integrated pedagogical and andragogical approach that will make learning truly self-determined and skill-based.

Unfortunately, in most developing nations, there is proliferation of teachers because teaching is not professionalized; and so, anybody that has passed through the secondary school is allowed to teach, depending on his level of education. The resultant effect is that most of such auxiliary teachers use traditional methods they were taught or which they read in books haphazardly, thus leaving pupils in perpetual confusion and less productive. So, there is need for fundamental changes in the curriculum of teacher education where teachers in training would be exposed to different current ideas, innovations and curriculum development in the field of education. In the same vein, auxiliary teachers already in the system should be introduced to current discourse in the field. This is because demands on teachers continue to grow and become more diverse, and their own education too needs to reflect this.

Be that as it may, teacher education in most countries, especially developing nations, gives an impression of rethinking and restructuring of the curriculum to improve on the traditional method that teacher training students are dogmatically exposed to.

Pedagogical Approaches to Teaching

Pedagogy literarily means ‘the art and science of teaching children’. Students are treated as passive and dependent individuals. A pedagogical model is a content model concerned with the transmission of information and skills. Specifically, pedagogy is aimed at transmitting knowledge to learners who are presumed not to have the means or ability to learn on their own. It is characterized by a relationship of dependency between teacher and learner, where the latter is mostly passive and he is taught by, or learns from, the former. Pedagogy is very crucial to teacher education development in every nation. Teacher education is very germane to the technological development of every nation and, without proper methodology, professionals will not be able to positively interpret new developments in the field of education. To achieve this, a paradigm shift from the traditional ‘transmission’ approach to one which is more complex, interactive and evolving is required (Muijs and Reynolds 2001).

Pedagogy assumes that the learner lacks relevant knowledge and experience and is incapable of determining his learning or educational agenda. As such, the agenda is to be set by the teacher or educational institution. So, the teacher unilaterally decides what is to be learnt and how it is to be learnt (Knowles 1984). This educational agenda, according to Brookfield (1986) is based on subjects sequenced in terms of level of difficulty and the skill level of the learner. Even though it could probably be effective and appropriate, given certain educational goals, participants, settings and subject-matter, it cannot address every individual’s learning desires and needs.

Pedagogical approaches to teaching can be broadly divided into two, namely: (a) direct instruction/whole-class teaching; and, (b) reflective approaches. Most teachers were taught using these traditional approaches. So, they are used to them and many are still attached to them even now. This is affecting negatively the productivity of many teachers and student teachers. The direct teaching approach essentially is a teacher-centred approach where the teacher is the boss and he is regarded as ‘all-in-all’ by the learners. Mostly, it includes teaching techniques like the lecture method and whole-class teaching techniques. The reflective approach, on the other hand, improves on the former by allowing the learners to reflect on teaching activities and contribute their own quota to classroom discourse. It includes approaches like the discussion technique, questioning and project techniques, library method, etc.

Direct Instruction/Whole-Class Teaching

This is one of the most widely used methods of teaching the world over (Muijs and Reynolds 2001). Direct instruction is also known as active teaching or whole-class teaching. Essentially, direct instruction is a teaching style in which the teacher is actively engaged in bringing the content of the lesson to students by teaching the whole class collectively and directly. This method has been employed in schools for a very long time. The method emphasizes the content of the subject matter more than the place of the students to be taught. In other words, it is teacher-centred and the teacher is regarded as a master, an all-in-all and a boss. He gives out instructions to students on the subject-matter, allows students to work on the instructions after explaining it to them, and sits in his office to mark the responses of the students. The students are usually expected to be subjected and obedient to the teacher's instruction and the teacher can do and undo with the content of subject-matter.

Researchers have shown that the behaviours of teachers using this method in the classroom have direct effect on the students' outcomes, such as, rate of assimilation during teaching, level of interactions among students and teachers as well as test and examination scores. In a research conducted by Rosenshine, as quoted by Muijs and Reynolds (2001), it was discovered that the impacts of the teachers using this method vary depending on their level of effectiveness in the class. So, students of effective teachers that spend significantly more time in the class are likely to perform better in the specific areas of learning earlier identified than students of ineffective teachers that spend less period of time with their students. Thus, Fitzparrick in Muijs and Reynolds (2001) discovered that teachers that have the attitude of spending more time with their students engage students more productively in the classrooms and this account for more productivity of students. He then suggested that such behaviours should be taught so as to make teachers using such method more productive and relevant to their environment.

Similarly, Mortimore (1988) identified significant positive effective behaviours of teachers as: frequent questioning, structured session of teaching, use of higher-order questions and statements, involvement of students restricting sessions to a single area of work, and the proportion of time utilized in communicating with the whole class. However, they discovered in their study that teachers communicating with the whole class at the same time were more effective than those communicating with students individually because students performed better in the evaluation of their work in the former than the latter. Even though the outcome of the research conducted by Muijs and Reynolds (1999) supported the above finding, Creemers' (1994) finding was not in support of it. On the whole, it has been discovered through research that actively teaching the whole class is more effective than letting individual students work on their own during most of the lesson. In spite of the effectiveness of this approach to teaching, it is not necessarily the best strategy to use in all circumstances.

Reflective Approach

The discussion of this approach will be based on the 'Reflective Teaching Model'. According to Moore (2001), this model was publicized by Cruickshank. This model prepares the student teachers to be self-monitoring individuals. Unlike the traditional methods of training that are directive in nature, the reflective approach entails that student teachers train in skills that will encourage self-analysis of teaching episodes, reflection and focusing on events rather than on personalities, and systematic observation for patterns and trends of teaching and learning behaviour. Reflective teaching suggests that teachers must inquire into students' experiences and build an empirical understanding of learners and a capacity to analyze what occurs in classrooms and in the lives of their students (Vaidya 1997). Reflective teaching will empower student teachers to adapt their teaching to focus on inquiry and problem-solving activities that change the orientation from static teaching to dynamic teaching. It can therefore be explained that reflective teachers are positive to changes and are always ready to learn all they can about teaching from theory and practice. So, they teach and reflect on teaching. Thus, the reflective teaching model will empower student teachers to deliberate on their teaching.

Schon (1987), in his own discussion on the reflective teaching model, points out that it requires careful planning, where the student teacher is expected to 'reflect-in-practice' and also 'reflect-on-practice', especially in the area of classroom teaching and learning. The model equally entails that the student teacher be sensitive to the diversity of students' needs, takes into consideration learners' family backgrounds, their intellect, self-esteem, emotions and self-worth. This will really encourage the learners to be more active and ready to participate meaningfully in the teaching/learning experience. Reflective teaching makes the teacher avoid dogmatism or routine approaches in his teaching; rather, the teacher adapts his teaching to the day-to-day activities of the learners and always seeks learners' satisfaction in his lesson delivery. He sets out to achieve all these by engaging learners in their lessons and encouraging them to assume responsibility for their own learning. The reflective model makes the teacher adapt subject matter to the individual needs of learners so that they formulate their own rules, principles and philosophies for better classroom practices.

Andragogical Approach

Andragogy is the art and science of teaching adults and of adult learning in a climate where the learner is given primary consideration. As specified by the exponent of the approach (Knowles 1970), andragogical approach to learning includes both technical and interpersonal characteristics; and so, it is based on some assumptions. The first assumption suggests that as a person matures, he moves from a dependent personality towards a self-directed human being. So

teachers/facilitators consequently have responsibility to assist learners in this movement towards self-directedness. The second assumption is that every learner has an ever-increasing reservoir of experiences, which serve as an important resource to be encouraged and utilized extensively by the teacher/facilitator. The third assumption is based on adults' readiness to learn and this really helps learners to cope with real-life tasks or problems. As we mature, our readiness to learn becomes increasingly oriented to the various social roles in our lives and to the developmental tasks found within these roles. An adult learner sees education as a means to develop increased competence, which is Knowles' fourth assumption. Time perspective also changes from one of postponed application to immediate application of knowledge, and the orientation towards learning moves from subject-centredness to problem-centredness.

As teachers/facilitators, our role therefore is to provide learning opportunities which focus on real-life tasks and problems that are immediately applicable to learners. These assumptions were a significant shift from the traditional or pedagogical-focused education of the time; it is learner-centred as opposed to the teacher-centredness of pedagogy. The main goal of this approach is the self-actualization of the learner and the role of the teacher is to assist learners develop their full potential to reach their learning goals and objectives.

Despite its uniqueness, some still see andragogy as being inadequate and inaccurate. Because voluntariness is one of the cornerstones of andragogical assumptions, there is need to specify the degree of the voluntariness when it is used for children. It will be more appropriate to the highly motivated learner than the less motivated ones who are likely to prefer a teacher-centred approach (Rachel 1987). Rachel then suggests an integrated approach where both pedagogical and andragogical approaches would be used, depending on the goals, objectives, environment and level of motivation of the learners.

Integrated Pedagogical and Andragogical Approaches as a Framework for Teacher Education

This framework is known in education as the 'Quality Teaching in Public Schools'. The core business of the profession of teaching is pedagogy. Gore (2001) identified pedagogy as the core of the teacher education enterprise that has implications for 'the what' (the curricula) and 'the how' (the pedagogy). Pedagogy focuses attention on the processes through which knowledge is constructed, produced and critiqued. Thus, pedagogy maintains that how one teaches is inseparable from what one teaches, from what and how one assesses and from how one learns.

The educational scene is evolving rapidly in response to societal developments. Education has traditionally been seen as a pedagogic relationship between the teacher and the learner. It was always the teacher who decided what the learner

needed to know and, indeed, how the knowledge and the skills should be taught. In the past thirty years or so, there has been quite a revolution in education through research into how people learn, and resulting from that, further work on how teaching could and should be provided. Andragogy (Knowles 1970) provided many useful approaches for educational methodology and, indeed, has been accepted almost universally. The principles of adult learning that were derived from it transformed face-to-face teaching and provided a rationale for effective education based on the notion of self-directedness.

There is, however, another revolution taking place in educational circles that appears to go a step beyond andragogy, to a new set of principles and practices that may have application across the whole spectrum of the education and learning lifespan. It is the Integrated Pedagogical and Andragogical Approach. This approach recognizes the changing world in which we live; a world in which information is readily and easily accessible; where change is so rapid that traditional approaches of training and education are totally inadequate, and discipline-based knowledge is inappropriate to prepare for living in modern communities and workplaces. Learning is increasingly aligned with what we do; modern organizational structures require flexible learning practices; and there is need for immediacy of learning. In response to this environment, there have emerged some innovative approaches that address the deficiency of the pedagogical and andragogical methods. In essence, the integrated pedagogical and andragogical approach adopts the philosophy, practices and assumptions of both pedagogy and andragogy.

The thrust that underscores these approaches is a desire to go beyond the simple acquisition of skills and knowledge as a learning experience. This approach emphasizes, in the learner, more holistic development of an independent capacity – the capacity for questioning one's values and assumptions and critical role of the system-environment interface (Stephenson 1993). Integrated pedagogical and andragogical approaches centre around the study of self-determined learning and draw together some of the ideas presented in both approaches to learning. It is also an attempt to challenge some ideas about teaching and learning that still prevail in teacher-centred learning and the need for 'knowledge sharing' rather than 'knowledge hoarding' (Stephenson 1993.) Integrated pedagogical and andragogical approaches look to the future in which knowing how to learn will be a fundamental skill, given the pace of innovation and the changing structure of communities and the work-place.

The findings of the research conducted by Delahaye, Limerick and Hearn (1994) indicated that learning could be two-dimensional, utilizing both pedagogical and andragogical principles at the same time. By this, Delahaye et al (1994) had injected the findings of their research into the work of Stuart and Holmes (1982) and formed a model of four stages of learning. Stage 1 in the learning model

represents the interpretation of pedagogy orientation model; stage 2 describes that of andragogy learning orientation; stage 3 may be visualized as a partial stage where students prefer pedagogical as well as andragogical orientation to study; and stage 4 may be best visualized as only involving the learner without the assistance of a teacher or facilitator (Choy and Delahaye 2003).

A study conducted by Choy and Delahaye (2002) has also indicated that the orthogonal relationship between pedagogy and andragogy grants new learning orientations and instructional strategies, especially in the online learning area. Findings of the study revealed that among the 266 young people aged 17-24 that were enrolled in a programme, the youth preferred pedagogical as well as andragogical approaches. In a similar research conducted by the same researchers in 2003, they discovered that youths (aged 18- 24) were surface learners with low readiness for self-directed learning but preferring a combination of structured and unstructured learning. They suggest that youth learners are at stage 2 in the four stages of learning development.

Even though Knudson (1980) is not against integrating pedagogy and andragogy, he suggested a term 'humanatology' that would reintegrate the assumptions of both approaches for better understanding. According to Knudson, humanatology is a 'holistic' approach that puts learning into its own perspective. Essentially, the concept of humanatology takes into account the development of the whole human being from birth to death. Knudson concluded that both the pedagogical and andragogical approaches have something to offer; they complement each other and are equally necessary for effective teaching/learning transactions. This is very relevant to the eclectic approach that will be discussed later.

Theories

This work is based on two important theories, namely, Creativity Theory and Eclectic Theory.

Creativity Theory

The Theory of Creativity could be deduced from Dewey's principle of teaching (Starko 2001) and it involves five main logical steps, namely: (a) feeling and nursing a difficulty; (b) locating and defining the difficulty; (c) identifying and considering possible solutions to the difficulty; (d) weighing the consequences of these solutions; and (e) accepting one of the solutions to the difficulty. Thus, the creativity approach to teaching goes beyond mere regimented methods of teaching. It includes in the training of student teachers activities that would empower them to be inquisitive and ready to ask questions as well as proffering solutions to teaching/learning transactions. It would empower the student teachers not to be dogmatic but proactive and alert all the time. Problem-solving activities would make the student teachers sensitive to their environment and ready to take educational risks.

Perkins (1988) asserts that creativity makes one original and relevant. So, problem-solving activities would make the teacher produce novel and creative results that would make learning relevant, appropriate and durable. This description is broad and general. Even though the critiques of Perkins were of the opinion that the novelty of a method of teaching would depend on the originality of the creativity and what is new in an environment might not be so in another environment; yet it creates a sense of discovery in the mind of teachers. Besides, problem-solving theory empowers learners to be unique; and it is individualistic. Thus, from Perkins' viewpoint, creativity in teaching brings about a new idea peculiar to the innovator (teacher) and the learner. It encourages teachers not to be dogmatic but always proactive and sensitive to his environment.

The problem-solving model of creativity also emphasizes the appropriateness and relevance of creativity to the teaching-learning transactions. However, the appropriateness of any creative act is determined by the cultural context in which the creativity is based. So, as intelligence is viewed differently in various cultures, so do the vehicles and focus of creativity vary from culture to culture and across time, and each culture and discipline sets standards for creative activities (Starko 2001). This suggests that creativity in teaching must take into consideration the day-to-day activities of the learners; it must actually address the individual and collective needs of the learners and the entire society.

The Eclectic Theory

The Eclectic Approach is the type of teaching method that encompasses all the available teaching approaches that are valuable to the teacher. The main aim of the teacher using this approach is to achieve maximum benefits from these approaches at his disposal, according to the special needs and resources of the learners (Stern 1998). This approach was proposed as a reaction to the provision of teaching approaches in the 1970s and 1980s and it makes the teacher current and always alert. The teacher is expected to know and be conversant with as many approaches as possible and be able to use them appropriately. Thus, this approach is learner-centred since the teacher attempts to use diligently all his knowledge about different approaches and techniques to successfully explain a subject-matter to a learner in order to affect the domains of the learner at a given time in the teaching-learning process.

Essentially, the eclectic approach allows teachers to diversify knowledge and be able to meet the needs of the learners. Apart from the fact that the approach allows the teacher to adapt to any teaching situation, it equally allows the teacher to be flexible and versatile, thus sustaining the interest of the learner for a long time. The eclectic approach challenges both the learner and the teacher. This approach develops the creativity in both the teacher and the learner, thus

broadening their knowledge and empowering them to be more productive. All possible approaches can be integrated into this approach. This approach is very appropriate for teaching adults and children alike.

Critical Issue

The importance of training and competence of teachers in the Nigerian teacher training institutions cannot be over-emphasized because not all graduates of teacher education programmes eventually become great or productive teachers. Critiques of teaching quality consistently point a finger at teacher education, implying that if only teacher preparation was improved, then there would be better teaching. Teacher educators quite rightly identify all kinds of external factors that undermine their best efforts, such as poor funding of teacher education, class sizes larger than the average in secondary schools, and the socializing effects of school cultures. But most teacher educators will also accept that there are weaknesses and spaces for reform within their programmes and that the countless reviews of teacher education have made some reasonable observations and recommendations. The long history of reform in teacher education is indicative of teacher educators' own commitment to the seemingly never-ending quest for the preparation of better teachers. Nevertheless, and despite these initiatives, most teacher educators would acknowledge that there is a long way to go in ensuring that graduates become great (or at least good) teachers. Some of the challenges facing teacher education have been relatively weak knowledge base and the paradigmatic differences that have led to weak socialization effects, and to fragmentation and lack of coherence.

There is increasing awareness on the need for better pedagogical approaches for teacher education and training. From all indications, student teachers need to be exposed to more approaches than the traditional one of directive or whole-class approach to teaching that is currently prevalent in most of our teacher training colleges. Even though the concern for integrated approaches to training is increasing, many are still living in the past; thus, restricting themselves to the old curricula and rendering student teachers unproductive. This chapter explores the assumptions of both pedagogical and andragogical approaches as a framework with the potential for enhancing the quality of teacher education and the quality of teaching subsequently produced by graduates.

Methodology

The study adopted the descriptive survey design. This method is considered suitable because it permits one to use all data collected through questionnaire and personal interview to describe the available approaches used in training student teachers in faculties and colleges of education in Nigeria. The researcher did not manipulate the variables.

Even though nearly all the universities in Nigeria offer education courses, three federal universities and three state colleges of education in the south-west Nigeria were used for the study. The institutions used were first-generation universities in Nigeria and state colleges of education which have existed for over twenty years. These institutions were used because of their peculiar mode of admission. Apart from the fact that it is mandatory for them to admit students from all the tribes in Nigeria on quota system, they are also cosmopolitan and nearly all the tribes in Nigeria are represented in these cities where the institutions are. South-west Nigeria is equally the commercial nerve centre of Nigeria (Lagos) and it has one of the biggest towns in West Africa (Ibadan). All these give south-west Nigeria an upper hand in educational and commercial development in Nigeria. Thus, it is easy to generalize the result of the study from these universities and colleges of education. south-west Nigeria comprises the Yoruba-speaking states of Oyo, Ogun, Ondo, Osun, Lagos and Ekiti. The study used the following universities: University of Ibadan, Obafemi Awolowo University, and University of Lagos, while the colleges of education used were Lagos State College of Education, Osun State College of Education and Oyo State College of Education.

The population of this study was made up of academic staff members and students in the south-west Nigerian faculties of education and colleges of education.

Stratified random sampling technique was used to select the subjects for the study. This technique was adopted in order to obtain an adequate representative sample of the universities and colleges of education involved in the study. Stratified random sampling technique was used to draw the sample of the subjects from these universities and colleges of education involved in the study. A total of 600 subjects (50 lecturers and 50 students from each of the three universities; 50 lecturers and 50 students from each of the colleges of education) were randomly selected as the sample size for the study. So, the sample had equal representation of subjects from the universities and colleges of education and this is considered adequate enough to determine the approaches used by lecturers to train student teachers in south-west Nigerian universities and colleges of education.

A researcher-constructed questionnaire captioned 'Integrated Pedagogical Approaches for a Productive Teacher Education' was used for the study. The questionnaire comprised Sections A, B, C, D and E. Section A of the questionnaire assessed the bio-graphic data of the subjects like age, status (whether student or academic staff), sex, etc. Section B consists of 10 items and was designed to identify general approaches available to lecturers of student teachers in faculties of education in Nigerian universities and colleges of education. Section C, on the other hand, was to assess the directive (whole-class) approach to learning. It was to identify how many of the academic staff use the method in the universities and colleges of education, for how long they had been using it and why they prefer it to other approaches. It was also to find out whether these lecturers were

aware of other approaches or not. On the whole, eight questions were raised in this section. Section D consists of 10 items that assessed the level of awareness of lecturers about the 'Reflective Approach' to teaching-learning transactions in Nigerian universities and colleges of education. Finally, Section E sought information on what could be done to improve approaches to teaching-learning transactions in these institutions for better productivity of Nigerian student teachers. In all, seven questions were raised in Section E. Generally, the respondents were to rate the responses using a four Likert scale: Agree, Strongly Agree, Disagree and Strongly Disagree.

Experts in research methodology in Arts and Social Sciences Department of the Faculty of Education, University of Lagos, vetted and approved the content validity of the instrument. Reliability of the research was obtained through a field study in a test, re-test procedure, and the correlation coefficient ranged between 0.71 and 0.75 and this confirms the reliability of the instruments.

The researcher administered the instrument through the help of some research assistants (PhD students). Prior to this, the researcher had already sought the permission of the universities through their heads of department. The instrument (questionnaire) was administered to the students and the academic staff in these universities and colleges of education. The researcher had earlier sought the subjects' cooperation for truthful and unbiased responses. They were equally assured by the researcher of the confidentiality of their responses. Percentages were used in analyzing the data.

Result

The major findings of the study are divided into four parts. The first part established the general approaches available to student teachers' lecturers in faculties of education in Nigerian universities and state colleges of education. The second part established the approach commonly used by lecturers and reasons for their choices. The third part is on reflective approach, while the fourth identified the need for better integrated and eclectic approaches for training student teachers for productivity.

The analysis of the response of the teachers and the students indicates different approaches that are available for teaching student teachers in faculties of education in Nigerian universities and state colleges of education. The mean percentages of the available approaches are the following:

- Students are taught directly and collectively in the class – Direct Teaching (DT) 90.2%;
- Students are attended to individually in the class – Reflective Teaching (RF) 36%;

Table 18.1: Different Approaches Available

S/N	Questionnaire Items	Teachers' Response		Students' Response		Mean Agree % Disagree %
		Agree %	Disagree %	Agree %	Disagree %	
1	Students were taught directly and collectively in the class – Direct Teaching (DT) approach	257 (85.7)	43 (14.3)	284 (94.7)	16 (5.3)	90.2 9.8
2	Students are attended to individually in the class (DI)	201 (67)	99 (33)	17 (5.7)	283 (94.3)	36.3 63.7
3	Students were allowed to ask questions at any stage of the class (andragogy)	15 (5)	285 (95)	8 (2.7)	292 (97.3)	3.9 96.1
4	Students were allowed to make suggestions to teaching-learning transactions.	11 (3.7)	289 (96.3)	49 (16.3)	251 (83.7)	10 90
5	Students' views and personalities were respected by teachers	188 (62.7)	112 (37.3)	7 (2.3)	293 (97.7)	32.5 67.5
6	Teachers spend more time with students (reflective)	145 (48.3)	155 (51.7)	178 (59.3)	122 (40.7)	53.8 46.2
7	Teacher-student relationship should end in the class (DI)	289 (96.3)	11 (3.7)	3 (1)	297 (99)	48.7 51.3
8	Teachers should be more concerned with the delivery of the subject-matter rather than methods	205 (68.3)	95 (31.7)	221 (73.7)	79 (26.3)	71 29
9	Teachers need different approaches to teaching rather than lecture or direct teaching alone	195 (65)	105 (35)	176 (58.7)	124 (41.3)	61.9 38.1

Table 18.2: Direct Teaching (Pedagogical) Approach

S/N	Questionnaire Items	Teachers' Response		Students' Response		Mean	
		Agree %	Disagree %	Agree %	Disagree %	Agree %	Disagree %
10	Direct teaching is an age-long approach preferred by many lecturers and students	271 (90.3)	29 (9.7)	253 (84.3)	47 (15.7)	87.3	12.7
11	Direct teaching approach is used by many because it saves time	287 (95.7)	13 (4.3)	158 (52.7)	142 (47.3)	74.2	25.8
12	Direct teaching enables one to cover more contents	293 (97.7)	7 (2.3)	112 (37.3)	188 (63.7)	67.5	32.5
13	Many lecturers were trained with this approach and they need to pass it to students	148 (49.3)	152 (50.7)	197 (65.7)	103 (34.3)	57.5	42.5
14	The approach is preferred by many because it is not energy sapping	247 (82.3)	53 (17.7)	151 (50.3)	149 (49.7)	66.3	33.7
15	The approach does not require new skills	33(11)	267 (89)	131 (43.7)	169 (56.3)	27.4	72.6
16	The approach will enable students to respect teachers	236 (78.7)	64 (21.3)	228 (76)	72 (24)	77.3	22.7

Table 18.3: Reflective Approach

S/N	Questionnaire Items	Teachers' Response		Students' Response		Mean	
		Agree %	Disagree %	Agree %	Disagree %	Agree %	Disagree %
17	Reflective approach allows the teacher to individualize his teaching and allow students to internalize the subject-matter and demonstrate it	267 (89)	3 (11)	276 (92)	24 (8)	90.5	9.5
18	Reflective approach slows down teachers in achieving their goals and objectives	211 (70.3)	89 (29.7)	148 (29.3)	152 (50.7)	59.8	40.2
19	It is used sparingly in our teacher training colleges	294 (98)	6 (2)	291 (97)	9(3)	97.5	2.5
20	It allows students to be skillful but boastful	213 (71)	87 (29)	124 (41.3)	176 (68.7)	56.2	43.8
21	It can divert students' attention away from the subject-matter	198 (66)	102 (34)	85 (28.3)	215 (71.7)	47.2	52.8

- Students are allowed to ask questions at any stage of the class – Andragogy 3.9%;
- Student are allowed to make suggestions to teaching/learning transaction in the class – Andragogy 10%;
- Students' views and ideas are respected by teachers – RF 32.5%;
- Teachers spend more time with their students – Andragogy 53.8%;
- Teachers-student relationship should end in the class – DT 48.7%;
- Teachers are more concerned with the delivery of the subject-matter than approaches 71%; and
- Teachers use many approaches to deliver a lecture 61.9%.

The analysis of Table 1 indicates that even though the respondents indicated that there are more than direct teaching approaches available to lecturers of the student teachers; many of them are not utilizing other approaches to the fullest. One can only infer that teachers are not usually prepared for more than an approach for a teaching-learning transaction. This disagrees with Moore's (2001) view that teaching is a challenge that requires skills in planning and classroom. Also, the fact that the student-teacher relationship always ends in the classroom (48.7%) indicates that teachers are far from their students and there is little rapport between them and the learners. This goes against the creativity theory of Starko (2001) and Knowles' (1970) andragogical principle of teaching that emphasize the fact that, for a teacher to be effective, he needs to be creative; and creativity can only be achieved when the teacher takes into consideration the day-to-day activities of the learners and addresses their individual and collective needs through effective and meaningful rapport. One can then infer that the teachers of our student teachers are not limited in approaches to learning but because they are not creative enough, they are unable to fully utilize the available approaches.

The analysis of the responses of teachers and students on directive teaching as a pedagogical approach, as presented in Table 2, indicates the following:

- Direct teaching is an age-long approach preferred by many lecturers and students 87.3%;
- Direct teaching is used by many because it saves time 74%;
- Direct teaching enables one to cover more contents 67.5%;
- Many lecturers were trained with this approach and they need to pass it to students 57.5%;
- The approach is preferred by many because it is not energy sapping 66.3%;
- The approach does not require new skills 27.4%; and
- The approach will enable students to respect teachers 77.3%.

This result confirmed Muijs and Reynolds (2001) view that this approach has been employed in schools for a long time and it essentially emphasizes the content of the subject-matter more than the place of the students to be taught. Even though the approach is teacher-centred, researchers agreed that the behaviours of the teachers using this approach have direct effect on the learning outcome of the learners. According to the findings, the approach could have positive effects on learners whose teachers spend more time in the class and individualize their teaching and vice versa (Mortimore 1988; Rosenshine in Muijs and Reynolds 2001; Akinpelu 2002 and Oladapo 2007). Unfortunately, the result of the previous table clearly shows that most of the teachers spend less time with their students (46.2%) and teacher-student relationship ends in the class.

Responses to the questions in Section D in Table 3 indicate the following;

- Reflective approach allows the teacher to individualize his teaching; and allows students to internalize the subject-matter and demonstrate it 90.5%;
- Reflective approach slows down teachers' achievement of their goals and objectives 59.8%;
- It is used sparingly in our teacher training colleges because it is energy sapping 97.5%;
- It allows students to be skillful and boastful 56.2%; and
- It can divert students' attention away from the subject-matter 47.2%.

This analysis indicates that the reflective approach is sparingly used in our teacher training colleges. Even though the stakeholders (teachers and students) believe that it gives room for teachers to individualize their teaching (90.5%), they believe that it slows down teachers in achieving their goals and diverts students away from the subject-matter. The result of the response of the stakeholders disagrees with Moore's (2001) discovery that this approach, when used by teachers, makes learners self-monitoring, self-analytical and self-focused because it trains learners to be focused on inquiry and problem-solving activities. In the same vein, the finding that the approach diverts learners away from the subject-matter disagreed with the view of Schon (1987) that the reflective approach makes teachers sensitive to learners' needs and relate teaching to the day-to-day activities of the learners, thus making them responsible for their own learning.

The result of the responses on the need for eclectic and integrated approaches to teaching-learning activities in our teacher training colleges is as presented in Table 4, which indicates the following:

- There is need to make our approaches to teaching student teachers integrative 82.2%;
- Teachers of student teachers should be exposed to current approaches and training to be able to use the use the approaches appropriately 89%;

- Student teachers should not be limited to only one teaching approach 99.2% ;
- Reduction in students-teacher ratio will allow teachers to adopt varieties of approaches to teaching 75.5%;
- There is need for teachers to interact with students in order to establish healthy rapport and better productivity 92.7%; and
- Student teachers should constantly be exposed to better creative and eclectic approaches to teaching 91.8%.

The outcome of the analysis of Table 4 throws more light on the need for integrated pedagogical and andragogical approach for better and productive teachers of student teachers in our faculties and colleges of education. Some are new, while some only corroborate the existing study initially reviewed in the literature. The need for integrated approaches for teaching student teachers and more exposure of teachers to current training on current approaches corroborate the new integrated pedagogical and andragogical strategy provided by Knowles (1970) and Gore (2001). This new strategy was provided by the authors for the teachers to be more productive in the face of new educational development that is evolving the world over.

The finding that student teachers should not be limited to only one teaching approach but should adopt different approaches supports Stephenson (1993) view that the eclectic approach is more holistic in developing independent capacity of students for learning.

In the same vein, the study suggested that there is need to interact with student teachers to establish healthy rapport and better productivity. This suggestion supports Hase and Davis' (1999) view that the integrated pedagogical and andragogical approach encourage 'knowledge sharing' rather than 'knowledge hoarding' that the traditional approach usually encourages. Also, the suggestion that student teachers should constantly be exposed to eclectic and creative approaches is in support of Stern (1998) and Perkins (1988) that suggested that eclectic approaches will enable teachers to achieve maximum benefits from different approaches, while the creative approach will empower teachers to be original, relevant and productive.

Conclusion

From the outcome of this study, it is clear that the 'Direct Teaching' or 'Whole-Class Teaching' approach is the most common approach used by teacher trainers in our faculties and colleges of education. This has been having negative effects on the productivity of teachers; and the fact that many teachers believe that it is better for achieving goals and objectives in teaching subjects quickly makes it more prevalent in teacher training institutions, thus affecting the educational standard and level of productivity of the teachers in the society. There is need for more eclectic approaches.

Recommendations

Based on the findings and subsequent conclusion, the following recommendations were made:

1. There is need for the integrated pedagogical and andragogical approach (strategy) for teaching student teachers in our faculties and colleges of education. This could be introduced to teachers of student teachers gradually but in an emphatic way through constant training and exposure.
2. Teachers of student teachers should establish meaningful rapport with the learners and endeavour not to be distant from them. This will enable the former to establish not only the educational needs of the latter but also how to solve their problems collectively.
3. There is need for teachers to be more concerned with how their students learn rather than how much of the subject-matter to cover in a short time without much productivity.
4. It is time to expose teachers of student teachers to eclectic and creative approaches to teaching (rather than only direct teaching approach) to empower them to become better and more productive teachers after training.

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19

Strategic Planning for Quality Teacher Education

Ayo Alani

Introduction

Most problems confronting teacher education in particular and the education system in general in African countries could have been avoided if careful planning and diligent implementation of plans had been done. A number of African countries embark on implementation of education programmes without giving serious thoughts to how the goals and objectives of such programmes would be realized, considering the resources available to execute the programmes. Most times, annual plans are designed without taking into account the desired state of the education system in the next five or ten years. Comprehensive and long-term planning is therefore relegated to the background. The result is that orderly development of the education system cannot be guaranteed. Disjointed programmes are executed and coordination of efforts is absent, especially when another government takes over the mantle of leadership after the expiration of the tenure of an incumbent government.

This chapter focuses on strategic planning and how it can help to promote the quality of teacher education in Africa. Specifically, the chapter examines the concept of strategic planning, the strategic planning process and what should be done to enhance the quality of teacher education through strategic planning.

What is Strategic Planning?

Wikipedia (http://en.wikipedia.org/wiki/strategic_planning) describes strategic planning as the process by which an organization defines its strategy or direction and deciding on how the resources available to the organization will be allocated to carry out the identified strategy. Strategic planning therefore focuses on the

future course of action to be taken by an organization. Ajayi (Alani 2005:39) defines strategic planning as ‘a process that includes a set of interactive and overlapping decisions leading to the development of an effective strategy for a given system’. It is one of the essential instruments that are utilized to re-focus the education system in a number of countries. A strategic plan may cover a period of five, ten or more years and it spells out the current state of the organization and where the organization will be at the end of the plan period. Thus, strategic planning, like other types of planning, is futuristic. With the unpredictable state of affairs of most education systems in Africa (accounted for by a number of factors: dependence on limited sources of revenue, political instability, growing population, economic recession, and a host of others), it is absolutely impossible for a strategic plan to forecast with precision what will be the condition of the education system at the end of the plan period. It is therefore imperative for those responsible for strategic planning to embark on strategic innovation and tinker with the strategic plan, if occasion demands it, so as to accommodate future exigencies.

On the prompting of some international development partners such as UNICEF, a number of state governments in Nigeria have developed strategic plans for their education systems to improve the quality of education. The Education Sector Analysis Unit of the Federal Ministry of Education, Abuja, Nigeria, has also designed some questionnaires which can guide the process of strategic planning at the institutional, local, state and federal levels. The hope is that strategic planning will improve the effectiveness and efficiency of the education system so that the system can produce the needed human capital which is critical in promoting national development as envisaged in the development blueprints such as the National Economic Empowerment and Development Strategy (NEEDS), Millennium Development Goals, and Nigerian Vision 20:20 and the 7-point Development Agenda of the current Federal Government.

Strategic Planning Process

According to Wikipedia (http://en.wikipedia.org/wiki/strategic_planning), many approaches to strategic planning have been developed. One of them is the Situation-Target-Path approach where the planner evaluates the present situation in an organization and adduces reasons for the situation. He/she then defines goals and/or objectives to capture the state that is desired. After that, he/she charts an imaginable path to the goals and/or objectives. Another one is referred to as Draw-See-Think. Here, the planner identifies ‘the ideal image or the desired end state’. He then analyzes the current situation to point out the gulf that exists between the present situation and the ideal situation, and the reasons for such discrepancy. The next thing to do is to identify the steps to take to close the gap between the present situation and the desired state. Yet, another variant of Draw-

See-Think approach is called See-Think-Draw. Specifically, the planner examines the present situation; he defines goals and/or objectives and plots a route to attaining the goals and/or objectives. The last one, which is commonly adopted by state governments and some higher institutions in some African countries, including Nigeria, is that which points out the vision and mission of the organization and carries out a SWOT (Strengths, Weaknesses, Opportunities and Threats) Analysis. This examines the internal and external environments of the organization; formulates actions to be taken to achieve set goals; implements the actions and processes that are contemplated and controls the operation. This is fully discussed in this chapter.

Situational Analysis

In strategic planning, it is pertinent to analyze the situation in the organization and its environment at the point of planning, and what it is likely to be in the future. In the area of teacher education, it is important to analyze the number of institutions providing teacher education and their ownership, the number of students enrolled and their gender, number of lecturers and their gender, number of non-teaching staff and their gender, number of students in arts- and science-based disciplines, the type of curriculum used, facilities that are available (for example, classrooms, laboratories, workshops, recreational facilities, and so on) and their adequacy or otherwise, to mention a few. This information is required to plan for quality teacher education.

Vision and Mission Statements

A vision Statement explains the desired future state in the organization. For example, the vision of the University of Lagos, Nigeria, is 'to be a top class institution for the pursuit of excellence in knowledge through learning and research, as well as in character and service to humanity' (University of Lagos Strategic Plan: 2005 – 2009:3). With regard to education, the Mission Statement should indicate the principal objective of the entire education system at the local, state/regional, or country level. For instance, the mission of the University of Lagos, Nigeria, is 'to provide a conducive teaching, learning, research and development environment, where staff and students will interact and compete effectively with their counterparts, both nationally and internationally, in terms of intellectual competence and the zeal to add value to our world' (University of Lagos Strategic Plan: 2005 – 2009:4). Vision and mission statements should bear relevance to the development agenda of the government. It is equally essential to involve stakeholders such as students, lecturers, parents, professional groups, employers of labour, international development partners, and so on, when defining vision and mission statements. Staff, students and members of the public should be aware of the vision and mission statements of a teacher training institution.

SWOT Analysis

SWOT Analysis involves the identification of the Strengths and Weaknesses of the educational system, Opportunities that can be tapped and Threats confronting the system. Strengths and weaknesses are located in the internal environment of an organization while opportunities and threats are visible in its external environment. Strengths and opportunities are internal and external conditions, respectively, which can help in the realization of set objectives. Weaknesses and threats are characteristics of the organization that are detrimental to the achievement of objectives.

In carrying out SWOT Analysis, attention has to be focused on some major areas of teacher education, such as Access; Equity; Quality; Science, Technical, Vocational and Technological Education; Institutional Assessment; Monitoring and Evaluation; Educational Management Information System; Educational Infrastructure; Educational Planning and Management; HIV and AIDS Education; Special Needs Education; and Costing and Financing of Education. In doing SWOT Analysis for each policy objective, internal factors (strengths and weaknesses) can be identified using PRIMO-F, while PESTLE can be used to spot the external factors (opportunities and threats). PRIMO-F is an acronym for:

- People;
- Resources;
- Innovation;
- Marketing;
- Operations;
- Finance.

The job description of the employees and the skills they possess; the material resources and equipment that the organization has; new ideas that are considered to be essential to the organization; getting customers/clients to know what the organization does/the products that the organization has; how the activities of the organization are managed; and the prices of products, costs of production and investments that the organization has made and/or the investments that it can make. are those things that strategic planners could consider in using PRIMO-F to identify strengths and weaknesses, that is, the internal factors.

PESTLE stands for political, economic, social, technological, legal and environmental factors that should be considered in identifying the external factors (opportunities and threats). Issues such as intervention of government in the activities of all organizations that belong to a particular industry are those that come under the 'political factors'. To be precise, imposition of tax, labour law, environmental law, tariffs, trade restrictions and political instability come under the purview of political factors. Political factors are critical in SWOT Analysis in the education system because of the interest of government in the sector.

Matters such as economic growth, interest rates, exchange rates and inflation rate are germane when discussing 'economic factors'. Considering the education system, the rate of growth of the economy affects the resources that are devoted to the sector; interest rates affect the ability of educational institutions to borrow funds for their operations; exchange rates determine the amount of educational materials and equipment that educational institutions can order from overseas; while inflation rate – defined as general and sustained rise in the prices of goods and services – affects, in real terms, the value of the money devoted to providing educational services for the citizens.

Included under 'social factors' are issues such as the culture of the people, health consciousness, rate of growth of population, age distribution of the population, career attitudes and the premium placed on safety. In the case of Nigeria, culture, the way of life of a people, affects the rate at which people embrace western education. Because of the influence of culture, pupils' enrolments at the primary and secondary school levels are affected, thereby determining the demand for teachers and the rate of expansion of teacher education. The rate of population growth and age distribution of the population determine the number of school-age children, and hence, enrolment in primary schools and, therefore, the demand for teachers and teacher education programmes. If premium is placed on safety, the cost of teacher education programmes will increase because of the need to insure school buildings and equipment, teachers and pupils/students.

Matters that come under the 'technological factors' are research and development, automation, technological change and technology incentives. Research is one of the major functions of academics in higher education institutions, including those producing teachers. Innovations do arise from such research activities and these can affect the cost of education. In Nigeria, some teacher education institutions are producing technical and vocational subject teachers. Such institutions are supposed to invest heavily in technical and vocational equipment to give practical training to students. Where there are possibilities of procuring such equipment, they become an opportunity that can be tapped by an institution to have competitive advantage over its peers. There is also no doubt about the importance of computers in teacher education because of the need to equip teachers to keep abreast with developments around the world and also make use of the equipment in the teaching-learning process. Where resources are available to acquire computers, they become an external technological factor that provides opportunity for a teacher training institution.

'Legal factors' are essentially all legal enactments that affect the operations of an organization. Applied to the education system, all laws that touch on the operations of educational institutions should be considered in analyzing the opportunities that can be tapped and threats that they have to deal with. For instance, teacher education institutions in Nigeria can anticipate patronage on the basis of the fact that enrolments in primary and secondary schools will continue

to rise because of the provision of the Child Rights Act of 2003 and the Universal Basic Education Act of 2004 which compel parents/guardians to give their children/wards a minimum of basic education (9-year basic education consisting of primary and junior secondary education). Most state governments have also enacted Education Laws that list the legal requirements to be met before individuals and private organizations can establish private primary and secondary schools, while the federal government has promulgated Act 9 of 1990 which spells out the conditions that must be fulfilled before any individual, group of individuals or private organizations can open an institution of higher learning (university, polytechnic or college of education). Employment/labour laws, health and safety laws also come under the legal factors since they guide the employment of personnel in educational institutions. These laws itemise health and safety conditions that must be maintained in educational institutions respectively.

'Environmental factors' which apply mainly to educational institutions are weather and climate. At a time, school calendar in Nigeria had to be changed from January – December to September – June because some parents make use of their children on the farm during the rainy season, especially from May to July, thereby affecting pupils' attendance in school. Moreover, the way school buildings are constructed may vary from one place to another in a country because of weather and climatic conditions. This can raise the capital cost of education in those areas where heavy winds and cold weather can negatively affect school children and so they have to be protected against these vagaries.

The relevance of each of these factors in SWOT Analysis may vary from one teacher training institution to the other depending, for instance, on the location of the institution, the type of teachers it is producing (technical, vocational, science or art subject teachers), proprietorship (government or privately-owned), sources and amounts of funds and other resources at its disposal, influence that its proprietor(s) wield(s), reputation of the institution, the support it can garner from its old students, to mention a few. The location of an institution in an area with good topography will present opportunities for it to practice agriculture on a large scale for it to increase its revenue base, construct school buildings with modest cost and spend less on welfare support for students, for example, transport facilities (which can be provided by private vehicle owners as a result of good road networks), provision of fans and air conditioners (which may not be necessary because of the clement weather).

Policy and Strategic Framework

For each policy objective in each of the major areas of teacher education such as access, equity, quality and so on mentioned earlier, the planners need to identify the targets to be met, the strategies for achieving such targets, and individuals/bodies responsible for carrying out the activities. Table 1 shows what a policy and strategic framework looks like.

The first policy objective in Table 1 focuses on access to teacher education. The targets to be met, the strategies to be adopted and the bodies which will help to achieve the objective are found in the table. The second policy objective deals with the quality of teacher education. In the same vein, the targets to be achieved, the strategies to be taken and the bodies that will ensure that the objective is realized are mentioned.

Strategic Plan Implementation

After the preparation of a Strategic Plan and approval of same by relevant authority, the next thing to do is to implement it. A Strategic Plan Implementation Committee can be constituted to guide implementation. This can be done at the institutional, local, state/regional or federal level. It may also be necessary to set up sub-committees on each of the thematic areas of teacher education, namely: access, equity, quality and so on as given before. This will enable the Strategic Plan Implementation Committee to give each of these areas the attention it deserves. If it is not cost-effective to set up this committee, some other structure should be put in place to direct strategic plan implementation. In Nigeria, for instance, the Local Government Education Authority, State Universal Basic Education Board, State Ministry of Education or the Governor's Office can steer the implementation of the strategic plan. Some of those who formulated the plan should also be involved in the implementation of the plan. They can help to explain technical words used in the Plan, provide expert advice during implementation and help administrators interpret the plan. Stakeholders, such as students, lecturers, non-academic staff, representatives of government, and so on, should also be engaged in strategic plan implementation because they can provide invaluable information during this stage and also assist to co-ordinate the activities involved.

Monitoring and Evaluation

There is the need to monitor the implementation of the Strategic Plan in order to ensure that set objectives are achieved. The results obtained have to be evaluated to determine any departure from set objectives/goals and standards. In doing this, performance indicators that will be used at this stage have to be devised so that officers that are responsible for monitoring and evaluation will use the same yardsticks for measuring performance. Furthermore, with such performance indicators, monitoring and evaluation will be done objectively. A monitoring committee can be constituted and, depending on the coverage of the Strategic Plan, the committee can operate at institutional, community, local, district, state/regional and federal levels. The committee may also be based in the agencies of the state/regional or federal ministry of education. While monitoring should be done regularly, evaluation can be done on monthly, quarterly or yearly basis during the period that the strategic plan covers. Reports on monitoring and evaluation should be prepared and feedbacks given to those responsible for strategic plan

Table 19. 1: Policy and Strategic Framework

Policy Objectives	Targets	Strategies	Action By
Increase admission into teacher training institutions	<ul style="list-style-type: none"> •Teacher training institutions to increase enrolment •Increase number of beneficiaries of scholarship schemes by 500 each year up to 2015 •Provide qualified lecturers in teacher training institutions by 2012 	<ul style="list-style-type: none"> •Conduct needs assessment to determine the demand for courses in teacher training institutions •Conduct a public enrolment drive for teacher education 	Federal/State Ministry of Education Teacher training institutions
Improve the quality of teacher education	<ul style="list-style-type: none"> •Provide physical and material resources and equipment in teacher training institutions by 2012 	<ul style="list-style-type: none"> •Increase enrolment by 20% each year to reflect the need for teachers •Institute scholarship scheme to assist teacher-trainees in areas of critical need •Conduct survey on the need for more lecturers and more resources •Recruit qualified lecturers by 2012 •Replace lecturers who leave the institutions every year •Monitor the performance of lecturers in the institutions •provide classrooms, equipment and materials needed by the institutions by 2015 	Federal/State scholarship Board Teacher training institutions Governing councils Governing councils Heads of departments and Deans of Schools/Faculties Federal/State Ministry of Education

implementation. The feedback will ensure that deviations from set standards are corrected in time and that pre-determined objectives/goals or targets are accomplished.

With the treatment of the strategic planning process, the relevant question to ask here is: How can the quality of teacher education be enhanced through strategic planning? The answer to this question is the focus of the next section of this chapter.

Improving the Quality of Teacher Education through Strategic Planning

Strategic planning can help to improve the quality of teacher education. It is therefore recommended for all teacher training institutions in Africa. In Nigeria, for instance, most teacher training institutions only prepare annual budgets without carrying out comprehensive or long-range planning which strategic planning entails. When designing annual plans, situational analysis is hardly done. In the case of state-owned teacher training institutions, it is what the state governments can afford that is approved for the institutions except when accreditation of courses is to be done by the supervising agencies, such as the National Commission for Colleges of Education (NCCE) and the National Universities Commission (NUC). In teacher training institutions owned by the federal government, annual budget estimates are first scaled down by the NCCE before they are submitted to the Federal Ministry of Education for inclusion in the national budget. In most cases, the resources available are always not sufficient to implement programmes and projects. If strategic planning is instituted, situational analysis will point out the current state of affairs with a view to identifying the kinds of programmes that are run and the needs of the institutions, if stated objectives are to be accomplished.

Vision and mission statements are imperative in strategic planning. Unfortunately, a good number of teacher training colleges and faculties of education in Nigeria, for instance, have no stated vision and mission statements which can guide the planning process. To enhance the quality of teacher education, there will be the need to develop vision and mission statements with input from all stakeholders – students, lecturers, teachers' associations, employers of labour and international development partners. This will enable the institutions to benefit from the experiences of all concerned so that international best practices can be adopted. After all, African countries cannot operate in isolation; they have to take cognizance of what is happening around the world. Such vision and mission statements should concentrate on the three major functions of higher education – teaching, research and community service.

Identification of the strengths, opportunities, weaknesses and threats which impinge upon the functioning of teacher training institutions will help them to list internal and external factors which facilitate the achievement of stated objectives

(strengths and opportunities) and those that hinder the performance of the institutions (weaknesses and threats). Such exercise will help the institutions to determine the influence of political, economic, social, technological, legal and environmental factors on the operation and management of teacher training institutions and develop strategies for counteracting their negative effects and for utilizing their positive externalities.

Developing a policy and strategic framework will assist the institutions to be holistic in planning teacher education. All the relevant areas of the system will be covered, from the issues of access, equity, quality, the curriculum, the evaluation, the management and funding of the system. This will make for overall efficiency and effectiveness of teacher education. A strategic plan will therefore eliminate the narrow and myopic thinking (focusing on academic programmes and the resources required to run them) which annual budget estimates focus upon in planning teacher education.

Conclusion

Most of the problems associated with the educational planning process in African countries, for example Nigeria, such as lack of long-range planning, absence of situational analysis of the education sector, less emphasis on vision and mission statements and identification of the internal and external factors which are helpful to the achievement of set goals (strengths and opportunities) and those that can impede the performance of the education system (weaknesses and threats), less premium on targets and strategies for accomplishing policy objectives and time limits for each activity, non-identification of personnel/bodies responsible for implementing each activity and the like, can be tackled through strategic planning. Development of annual plans can be facilitated where there is a strategic plan which normally covers five to ten years. Strategic planning therefore holds a promise for giving proper direction to the education system. It will help the efforts of co-ordinating the activities of all parts of the education system to promote effectiveness and efficiency in education.

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