

4. Making the Introduction of Multi-media Technologies Count in Education Reform in Africa: The Case of Ghana

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ABSTRACT

This contribution reviews the introduction of old and new information communication technologies in Ghanaian education. It points out how the recent proliferation of multi-media technologies in the country has ultimately encouraged the introduction of ICTs in education. However, the author argues that much of the move to introduce these new technologies into schools and colleges has not reflected the need to re-conceptualise teacher education curriculum practices to base its foundations on constructivist ideas about knowledge and its production. Without this, reforms to introduce new information communication technologies in classrooms risk becoming tools that are again used to reinforce old traditions of teaching and learning based on uncritical transmission of knowledge. Finally, the author argues that changes to the teacher education curriculum in Ghana, and elsewhere in Africa, should also reflect the new professional learning identities and learning experiences that ICT and other media communication tools are meant to foster in the classroom.

KEY WORDS

Education reform, ICTs, pedagogy, teacher education, curriculum development, competences, child-centred teaching.

1. Introduction

In the last 25 years, Ghana has experienced a number of reforms to restructure and improve the delivery of education as a public service. None of these reforms have included or incorporated media literacy as a part of curriculum reforms. Nevertheless, the awareness and attempts to use a wide variety of media communication tools and information technologies to expand educational access and quality have been part of reform thinking and planning. Two main approaches have been used to introduce first old media communication tools (e.g. radio) and more recently new communication technologies (e.g. computers) into education. The lessons from these attempts needed to be drawn and their potential to improve educational quality in Ghana need to be considered. Essentially, for much to be gained from the introduction of new communication technologies in education, reforms must start with significant changes to the traditional teacher education curriculum so that prospective teachers become more accustomed to using them in carrying out aspects of classroom teaching. Unless this happens the benefits expected are unlikely to be deep and lasting since traditional authoritarian notions about teaching and learning runs deep in the professional culture of Ghanaian teachers, as in many other cultures in Africa and elsewhere, and thus requires a fundamental shift in the way in which teachers' organise classroom learning for new multi-media or ICT-enriched pedagogies to be assimilated.

2. Using Radio in Education Service Delivery

Ghana is known to have had one of the best educational systems in sub-Saharan Africa from colonial times well into the late 1960s. This changed from the early 1970s when its faltering economy precipitated steep decline in the quality of its education system (World Bank, 2004). In 1987, new education reforms were initiated to revive Ghana's educational system and radio was seen as an important tool for improving access to instructional content. Although, before the reforms, radio had been used to broadcast educational programmes, it was felt that, because it had lacked inputs from educational practitioners, programme content and methods of delivery were poor. In fact, much of the programmes focused on transmission of knowledge with few opportunities for two-way critical dialogue between teachers and learners (World Bank, 1989). The programmes were transmitted by the national broadcasting media which devoted two hours of airing time a day to primary, junior secondary, senior secondary and teacher training institutions. In total, this came to about ten hours of educational programmes per week which were divided into 50 slots for secondary and teacher training institutions. Generally, these school programmes were not cost effective given the small number of listeners they reached. Table 1 shows the time allotted and audience reach of the broadcasts. About half allotted time went to senior secondary and teacher training both of which constituted only 7 percent of the listening audience.

| Levels and Number of Grades | Number of Slots Allocated | Approximate number of potential listeners per grade |
|-----------------------------|---------------------------|---|
| Primary II-VI | 16 | 200,000-300,000 |
| JSS 1 & II | 34 | 160,000-180,000 |
| Senior Secondary I-V | 30 | 20,000-30,000 |
| Teacher Training I-IV | 20 | 2,000-3,000 |

Table 1: Radio Programme Allotment For Pre-tertiary Education Pre 1987 Education Reforms.
Source: World Bank (1989).

An extract of one of these broadcast illustrates (Figure 1) just how focused they were on transmission of knowledge using a one-way communication format to convey subject content material. If they were going to contribute to productive learning, a format which allowed students to engage in real dialogue with the teacher and gave voice to their understandings and insights was essential. In addition, classroom teachers would have had to organise relevant learning materials prior to the broadcast and prepared to raise new issues for further discussion after the broadcast.

GBC Sample Scripts

School Broadcast – Life Skills Series

Lesson V

Teacher: Good morning children. Today we shall have a short test before we take the day's lesson. Take your pens and papers. Complete the following sentences by supplying the missing words:

- The size of your body, the colour of your skin and the height of your body may be signs of Heredity from your parents
- The way you look, act, think and behave all go together to make your Personality [...]

Now children our topic for today is the sources of food that we eat in Ghana. Some foods grow well in certain areas... for example, millet, rice and guinea corn grows very well in the Northern and the two Upper Regions.

Two dishes that are prepared from millet for example are Tuo Tsafi and Fula... Children, can you think of at least one dish, prepared from guinea corn and two from rice grown in the North. In addition there are guinea fowls and other birds which are killed for food...

Now children make a list of all the foods that are grown in the area where you are and the ones that your mother buys from the market too. Try to put them in 3 groups according to the list we have just discussed i.e. 1) Grow foods; 2) Protective foods; and 3) Energy foods

(World Bank 1989: Annex 11-2)

Figure 1: Extract of Radio Broadcast to Schools

Although the broadcasts were accompanied by teachers' guides and pupil workbooks, in reality few schools got the guides before the broadcast (World Bank, 1989). Therefore there was little potential for the programmes to make an impact on classroom learning beyond the level of transmitting factual knowledge. Despite the limitations of radio broadcasting, Ghana's 1987 education reformers were still keen

on using this medium to present educational courses to schools and colleges. Reformers argued that earlier programs did not include curriculum specialists, teachers, or input from subject associations (e.g. science and mathematics teacher associations), who were in a better position to advice on which material was appropriate for radio and how it could be transmitted effectively. The new idea was to use school radio broadcasts to teach topics that teachers generally found difficult using subject experts with deeper understanding of the issues. Basically, education reformers saw radio as serving three main purposes under the new education reforms –as a direct teaching tool, as a learning resource, and as a medium for enriching conventional teaching. And yet, for each of these, the radio has limitations. Although some of the programmes discussed new pedagogical approaches and encouraged teachers to write to the producers with their questions, the interaction was still didactic and uncritical. As time went on, the programmes were used to propagate ideas behind basic education reforms which were mainly about education for self-employment and rural development (World Bank, 1989 for a fuller discussion). Later, programmes for senior secondary students were abolished and more air time allotted to the primary school level where the bulk of new investments in education was going.

The main limitation of using radio to transmit education programmes is that it is simply not the most effective tool for demonstrating more interactive classroom discourse which shows the importance of learners' background and learning experiences. This is still the case even though new information communication technologies provide new opportunities to widen access to knowledge and create diverse uses of such knowledge. The capacity of teachers to maximize the benefits remains largely limited because of a deep rooted teacher-centred professional culture existing in schools and teacher education institutions that goes beyond the technology itself (Akyeampong, 2003). Before discussing the challenges new information communication technologies face, it is necessary to consider briefly how democratic reforms from the early 1990s set the scene for greater use of multi-media communication tools in Ghanaian education. Coincidentally, this was also the period of general education reforms in many African countries which were undergoing political changes and moving towards more open societies. It is therefore not surprising that as those countries in Africa start dismantling their autocratic political systems, media and information communication technologies become more accessible and appear to aid the democratization of their societies.

3. The Liberalising Influence of Democracy on Media, Information and Communication Technology in Education

Ghana has had its fair share of political turmoil as an African country. Following a promising political and economic start after independence in 1957, press freedom and democratic governance suffered severe setbacks as a result of a succession of coups that curtailed freedoms and produced a culture of silence in Ghanaian society. Democratic governance emerged once again after the government of Flt Lt Rawlings who had come into power through a military coup in 1982, initiated social and

political reforms culminating in a new constitution in 1992. This new constitution paved the way for new press freedoms which led to an increase in the number of privately-owned newspapers and magazines, the proliferation of privately owned television and radio services and broadcast, and an expansion in video film making and exhibition.

As the economy recovered after the years of decline in the 1970s, there was resurgence in investments in education led by the World Bank and other international development institutions, like UNESCO. The investments went primarily to improve facilities and infrastructure in basic education and gradually extended to the secondary and teacher education sectors. The 1987 education reforms had three stated goals:

- To expand and make access more equitable at all levels of education.
- To improve pedagogic efficiency and effectiveness.
- To make education more relevant by increasing the attention paid to problem-solving, environmental concerns, vocational and technical training and general skills training.

A significant change was the restructuring of education from 17 to 12 years, which produced savings to improve access to basic education and the quality and quantity of school infrastructure and instructional materials. The new structure of basic education consisted of nine years made up of six years primary and three years junior secondary education. The school curriculum was revised to include more practical subjects and in 1995 further reforms dubbed «Free Compulsory Universal Basic Education» (FCUBE) were introduced mainly to tackle the problem of educational quality. Evaluation and impact studies suggest that both the 1987 education reforms and FCUBE succeeded in reversing education decline –basic school enrolments increased by over 10 percentage points from 1987 to 2003, but quality remained difficult to improve (World Bank, 2004). From the late 1990s on, a number of interventions that were supported by donor institutions such as the UK's Department for International Development (DFID) introduced new syllabuses, textbooks and teaching guides and lately private/public partnerships have joined in to introduce ICTs into mainstream education as part of the efforts to improve educational outcomes (GOG 2002; MOE, 2008). It was the 1992 constitution which had introduced liberal and democratic governance that seems to have encouraged the private sector at national and international level to support public educational initiatives in schools with a strong emphasis on student-centred learning. Some of this support took the form of investments in school infrastructure and equipment, and lately the establishment of computer laboratories in secondary and technical vocational institutions. Somehow these are perceived as initiatives and equipments that are going to transform the student learning experience and prepare students to participate in the technologically driven global economy.

4. ICTs in Education: Panacea For Improving Educational Quality or Reinforcing Older Traditions of Education?

Almost without exception, all sectors of education in Ghana have witnessed widespread introduction of ICTs in the classroom. They have become popular infrastructure for school improvement. Prominent developments of this kind include

the following partnerships either with Inter-Governmental Organizations like UNESCO or NEPAD or with private sector international corporations (MOE, 2008):

- The Ghana e-Schools and Communities Initiative (GeSCI), which is a collaborative venture between the Ministry of Education and ORACLE and CISCO Consortia, and the NEPAD e-Schools initiative. It has been implemented in six out of the ten regions in the country. Each participating school has been equipped with a computer laboratory consisting of 25 computers, satellite internet connectivity and other state of the art equipment for e-Learning.
- Four hundred desktop Computers have been supplied to the thirty-eight Teacher Training Colleges in early 2007 under a Ghana National Commission for UNESCO Initiative.
- An online portal «skool.gh» and a DVD-based resource for teaching and learning of mathematics and science for Junior and Senior High Schools has been developed in collaboration with INTEL Corporation and was launched in 2008.
- ICT-literacy as a subject has been introduced in the curriculum of all pre-tertiary education (primary, secondary, technical and vocational education). Much of this curriculum focuses on computer skills.
- New syllabuses for the 2007 Education Reforms have been digitised and captured on Compact Disks (CDs) for distribution to all Districts and Schools. They include ICT literacy.

Capacity-building initiatives to support the ICT in education have also been intensified. For example, 100 ICT tutors in the thirty-eight teacher training colleges in the country have been trained in how to integrate technology in the teaching/learning process under Microsoft's Partners in Learning (PIL) Programme. Fourteen staff and personnel from the Curriculum Research and Development Division of the Ghana Education Service, and from the University of Cape Coast and the University of Education Winneba (Ghana's tertiary level teacher education institutions) have been trained in Digital Curriculum and Content Development. An ICT in Education programmes unit has also been established at the Ministry of Education which has trained over 550 ICT teachers in Senior High Schools and 50 school inspectors. Also, a total of 50 primary and Junior High School teachers have been trained in the use of ICTs in teaching and learning under a program called the UNESCO Net Program (MOE, 2008).

What has been notable about all of these developments is the emphasis on training to use the new technologies for educational purposes. But their success hinges very much on the extent to which, as pedagogical tools, they combine effectively with changes to the pedagogical culture of teachers which is essentially a perspective on learning as passive assimilation of knowledge. Much has been said about how ICTs can foster deep learning, such as supporting the development of problem-solving skills and skills in learning to learn. But this can only be achieved through a more interactive and dialogic relationship between teachers and students.

Once digital infrastructure and its accompanying logistics enter the Ghanaian or African classroom environment, much in the same way as happens in other regions, they present new challenges that relate to how teachers and students identities in the classroom should change to maximise the benefits in terms of productive learning outcomes. But more especially what needs changing are the existing attitudes and understandings about knowledge and how it is to be acquired. Whether or not teachers

and students see these new technologies in the classroom as tools for creating new ideas about knowledge reflecting their own experiences and perspectives of the world rather than simply as tools to transmit knowledge will depend on how ICT enhanced pedagogies have become well integrated into the school and teacher education curriculum. Although access to ICTs for educational purposes has dominated recent education policy initiatives in Ghana, not much has focused on the implications for a re-conceptualised teacher education curriculum built strongly on constructivist notions of learning which suggests «that people learn through the interaction between thought and experience: that both doing and thinking are essential for learning» (Stuart & al., 2008).

Deeply held knowledge transmission instructional practices and attitudes are not changed simply by introducing new technology into the classroom. There has to be fundamental changes to the way in which the curriculum defines how teaching and learning is to be transacted and knowledge treated. As Pryor and Ampiah (2003: 6) explain succinctly: «Beyond issues of access there is a second level of barriers to successful use of ICTs, concerned with attitudes and understandings rather than hardware and infrastructure. The existence of an environment conducive to new teaching methods and new relations between instructors and learners is a factor that must be taken into consideration. To take a few examples, if a wealth of new information reaches learners through the Internet, but then is processed through the traditional rote learning method and is taken as a body of facts that need to be memorised and recited on demand –not much has been gained. If art education resources in the form of the Web sites of international galleries and museums are made available to teachers and used in the classroom, the notion that some forms of art (to be found in certain physical and virtual sites) are superior to those forms which are not so available will be codified and reinforced. If the Encyclopaedia Britannica can be accessed through the Internet or CD-ROM, but such other sources of information as oral history or folktales cannot, the status of the former as a foundation for learning will be enhanced [...] This is particularly important in the context of Africa in which the status and value of different bodies of knowledge are subject to serious political and cultural contestation».

Thus, it immediately becomes clear that it is how the content of the school curriculum is constituted and the ability of teachers and students to evaluate critically this content that will ultimately determine the extent to which the new communication technologies in education will add value to the learning experience. It raises the importance of training teachers in media and ICT-enhanced or enriched pedagogies with the view to transforming the uncritical teacher-centred culture of learning so prevalent in many African schools still (Pontefract and Hardman, 2005; Akyeampong & al., 2006; Tabulawa, 1997).

5. Understanding Transmission Culture in African Classrooms

The image of the classroom teacher in the sub-Saharan African context is largely one of an authoritarian instructional leader dispensing knowledge usually through a didactic instructional process with students as passive learners (Akyeampong & al., 2006). Although new information and communication tools in education offers the prospect of changing this culture, for this change to be lasting, the way in which teachers and students relate to information and knowledge ought to change as well. Anyone familiar with classroom discourse in many African schools will immediately have noticed the highly didactic format of lessons. One of the major sources of this instructional behaviour is how content in school textbooks is presented, placing much emphasis on acquisition of factual knowledge which students learn by rote and reproduce in examinations (Kanu, 1996). In many instances, primary teachers see their teaching responsibility as first and foremost imparting factual knowledge and understand their students' role as assimilating the knowledge they dispense. This view of schooling coupled with an examination culture that filters students towards paid jobs in the labour market has sustained pedagogical classroom practices founded on behaviourism in many African systems. The notion of «behaviourism» relates closely to a teacher-centred model of teaching where basically the teacher is the one who determines what to learn, tells students how to learn, placing emphasis on practice and reproduction of knowledge as the test of achievement. Similarly, parents have come to judge successful schooling as the acquisition of knowledge dispensed by the teacher and the ability of students to regurgitate it when demanded in examinations (Tabulawa, 1997). It is within such a culture of teaching and learning that media and ICTs in education are entering, and unless the new technologies are used to provide contexts of learning where students for the most part engage in the «active construction of meaning» (Hopkins, 2002: 35), they are likely to slip into use as tools for the uncritical transfer of knowledge.

It is important to point out that technology is not new to education, and that constructivist learning does not come about simply by introducing media and ICTs into education. New technologies should be used as tools to create environments in which students learn by doing, receiving feedback, refining and building new understandings and knowledge. There is a difference between learning to use media and information communication tools and using them as tools for learning. This understanding is important, but is often confused by African governments reforming education. Much investment appears to go into the technology hardware and less to «software» reforms such as re-conceptualising curriculum materials and teacher education to support ICTs as a medium for learning to learn and the development of critical thinking. In effect, more emphasis should be placed on producing capacities for more interactive engagement of learners with each other and with teachers in classroom learning environment. That more interactive pedagogical methodology can be embedded in software and hardware design is an added-value of media and information literacy, however, it is important to stress that not all ICT products provide this opportunity, unless teachers and students are trained to engage with the knowledge and ideas they present in a critical and reflective way.

Research exploring African teachers' classroom roles and competencies in practice point to biographical and teacher education experiences as factors which shape their classroom identities (Lewin & Stuart, 2003; Wideen & al., 1998). By implication, the kind of exposure teachers get to new information and communication technologies in teacher education is key to how they will handle ICTs in their classrooms. Identifying opportunities within the teacher training curriculum where ICT-based pedagogies are used to promote deeper understandings of teaching, learning and assessment is therefore an important step towards improving their use in classrooms. A review of teacher education curriculum for primary and secondary teacher education in Ghana indicates that teachers get a very superficial or limited introduction and that integration with the whole curriculum is particularly weak (Akyeampong, 2004; Ampiah & al., 2002). But, there is evidence that African teachers have the capacity to recognize opportunities in their classrooms where constructive learning is engaged which must raise the potential to utilize new technologies in the classroom to foster constructive approaches to learning. Akyeampong and colleagues (2006) studied fifty Ghanaian teachers' understanding of learning, teaching and assessment in INSET workshop settings and found that although they instinctively defined learning based on models consistent with knowledge transmission theories, probed further, these same teachers were able to visualize real contexts in their classrooms where children actually learnt through social interaction and interrogation of ideas. They noted that constructivist learning was recognizable to the teachers but had just not received strong validation through their teacher education experience. Media and ICT-enriched pedagogies offer the possibility to validate these experiences by using media tools such as videos and cd-roms to capture real classroom episodes in which teachers scaffold students learning and engage them in critical dialogue and interrogation of ideas. Because new information communication technologies (computers, cd-roms, videos and digital cameras) allow presentation of multiple images, different perspectives and understandings about knowledge, they could be used to develop suitable pedagogic practices to counter unproductive pedagogies currently in use many Ghanaian and African schools (Pryor & Ampiah, 2003).

The challenge comes from the fact that prescriptive instructional behaviour has developed deep roots in many African teachers' professional culture. Progressive teaching methods, such as «child-centred», reflective practice approaches seem to have had limited success in dislodging this culture (Tabulawa, 1997). The situation has not been helped by the way in which school textbooks and curriculum documents, syllabuses are written. Mostly they are written in a non-inquiring style and language which then validates the prescriptive and authoritarian structure of teaching and learning in many African classrooms. African teachers' access to reference materials apart from those supplied by the state can be very limited. Thus, education reforms have focused much investment on increasing textbook supply (Windham, 1988; Lockheed & Hanushek, 1988), and for good reason –textbooks to pupil ratios can be as low as one to eight (Fobih & al., 1999; NEIDA, 1992). Improving the situation continues to be a gigantic task for many education systems in Africa. For example, one estimate suggests that by 2000 Africa needed US\$1390 million worth of

educational materials mostly in print form, but was only able to import to the tune of US\$625.7 (NEIDA, 1992). But the good news is that traditional values about knowledge and teacher role identity are not immune to the influence of globalization and the new technologies it introduces. Already, globalization is changing the way in which societies view and represent themselves. New ICTs and other media tools and their use in educational contexts, therefore, present real opportunities to transform work and knowledge production within African systems of education, especially as more of these societies embrace global technologies and are able to use them to engage in critical dialogue about the value, meaning and application of knowledge in different social context while preserving their cultural identity.

Significant changes to the Ghanaian teacher education curriculum are however needed to create a much deeper sense of the value of media and ICT-enriched / enhanced pedagogies in classroom learning. Teacher education reformers need to explore how such pedagogies can be used to tackle aspects of the teacher education curriculum which are difficult to handle in the college training context and which require more creative handling.

6. Re-Conceptualising Teacher Education Curriculum for Effective Media and ICT Applications in Education

As a result of the positive impact of both 1987 and 1995 education reforms in Ghana, primary and junior secondary enrolment has outstripped trained teacher supply and increased the number of untrained teachers (see Table 2). To address this problem of untrained teachers in the teaching profession, attention has turned to Open and Distance Learning as a cost effective approach. Another attraction of this approach is that it allows these teachers to continue with teaching whilst receiving training through a mixture of distance learning materials and face to face contact with tutors.

| | 2003/04 | 2004/05 | 2005/06 | 2006/07 | 2007/08 |
|----------------------|---------|---------|---------|---------|---------|
| Primary National | 73.9% | 72.4% | 70.8% | 62.1% | 59.4% |
| Primary Deprived | 55.3% | 53.2% | 55.9% | 42.8% | 37.2% |
| Junior High National | 84.2% | 83.5% | 85.5% | 77.2% | 76.4% |
| Junior High Deprived | 75.9% | 73.9% | 77.7% | 64.2% | 62.9% |

Table 2: Ghana: Percentage of Trained Teachers. Source: MOESS (2008).

In 2004, the Teacher Education Division of the Ministry of Education in Ghana with assistance from UK's Department for International Development (DFID) launched a programme that was to use ICTs to support the training of untrained teachers at a distance. Among its objectives was the use of mass media communications tools (radio and / or TV) to sensitise the target audience about the value of the programme. The programme was also going to explore how materials and information for the training could be made more widely available to the teachers by publishing them electronically. Teacher training colleges were also to be equipped with IT as well as

video and audio capacity in resource pools that would allow them to record demonstration lessons and remote classroom practice. In addition, teachers and college tutors were going to be trained with skills to develop multimedia materials for teaching (MOEYS/GES, 2004). According to the program designers, these strategies would ensure that the training engaged with the practical problems of teaching and narrowed the gap between theory and practice. For example, videos of remote classroom practice could provide real-life insights into teaching whilst audio discussions between 'experts' on elements of children's learning would focus attention on the importance of professional reasoning in teaching. This experiment was strong on ideas but short on practical achievement. The structure and content of the training followed much of what is already practiced in the traditional teacher training colleges. The programme is on-going and has trained 15,000 teachers so far, mainly using face to face interaction supplemented with distance learning text materials. One problem with the innovation is that the ideas behind them were cultivated externally and sold to local implementers. Both the external 'experts' and local implementers appear to have underestimated the practical and conceptual changes that were being demanded by the innovations and what this implied for wider systemic change in teacher education policy and practice.

Although there is no denying the potential of ICT to transform teacher education this way, implementation challenges are usually underestimated. The main challenges have to do with setup costs, human resource capacity, and, more importantly, effective delivery, which require significant modernization of training underpinned by constructivist principles of learning. In effect, this amounts to changing the view of learning to teach with its emphasis on uncritical transfer of knowledge to an emphasis on collaborative and inquiry-based approach to teacher learning. It is also about shifting the balance of responsibility for learning to teach to trainees. This could be achieved by using a wider range of resource materials including ICT applications to enrich the training process so that it achieves better outcomes in terms of knowledge about learning to teach and readiness to teach.

In the literature on media literacy and on education pedagogies, researchers in teacher education have called for greater exploration of the interface between educational theory and the realities of teaching, and asked for models of learning to teach that aim to deepen teachers' situational understanding of teaching so as to enhance their professional efficacy (Wideen & Grimmer, 1995). The introduction of modern communication tools such as videos, audio equipments and computers linked to the internet can indeed provide access to a very wide range of professional learning experiences that can then become material for exploring meanings and applications of theories of teaching and learning within particular classroom context. But it requires the forging of a more dialogic professional relationship between college tutors and untrained teachers who are not exactly novices but come with some professional and social capital. The introduction of ICTs in teacher education in Ghana has not addressed a fundamental question: What kind of teacher learning do media and ICTs encourage and how should the curriculum be designed and teacher educators trained to facilitate quality professional learning experiences using ICTs and other multi-media tools?

A key to the success in using an ICT-enhanced distance learning programme for untrained teachers is the effective organisation of the training to bridge the gap between theory and practice. This is dependent on infrastructural inputs as well as effective decentralised delivery, administration and support (Mattson, 2006). In the Ghanaian case, the fact that distance teacher education programmes have continued to rely mostly on print material suggest that these challenges have largely been underestimated. Moving to a situation where electronic media feature prominently in the training process is evidently much more than a supply problem. It is also about how demand for the technology is created in terms of hinging relevant aspects of teacher learning and professional development on material that is generated using ICTs and other multi-media tools. Currently, the ongoing teacher education programme for untrained teachers in Ghana has relied mostly on print and face to face training both of which has tended to favour transmission patterns of training. The opportunities that ICTs could have offered to enrich the training process have basically not materialised simply because the ontological underpinnings of teacher education in Ghana have not changed to reflect at a deep level, experiential or practical understandings of professional knowledge in teaching and how to develop it in teachers.

In 2002, a major review report on education reforms in Ghana was produced by a Presidential committee and contained among other recommendations 12 on ICT-use in education and 5 strategies to implement them (GOG, 2002). Much of the emphasis was placed on increasing the supply of ICTs in education and training teachers, tutors and education officials to use the technology for teaching and learning. There was nothing in this very important policy document about the importance of re-configuring relevant areas of the school or teacher education curriculum to encourage demand for its utilisation in classroom teaching and learning. Unfortunately, this is quite typical of many policies and programmes to introduce ICTs and other media communication tools in education systems in Africa.

7. Conclusion

What has been argued in this contribution, using Ghana as an example, is that, much of the recent effort to introduce ICTs in education have not been underpinned by fundamental changes to the teacher education curriculum content and delivery. This is key to how effective the new technologies will be in transforming classroom learning experiences across schools in Ghana and other African countries that have embarked on similar reforms. Reformers need to pause and think more carefully about what it is about a country's values and capacities that media and ICTs in education are expected to promote or change. It is after clarity on this has been achieved and wider systemic changes have been appropriately mapped out, that ICTs in education in Africa can promote wider social and economic development. Changes should also reflect the new professional learning identities and learning experiences that ICT and other media communication tools are meant to foster in the classroom. In Ghanaian education reforms this understanding has been lacking and similar situations probably exist in many education systems in Africa that are introducing ICTs and other media communication technologies into education.

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