

African-Centered Internet Literacy: An *Ubuntu*gogy Metadata Approach

by

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About the Author

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Abstract

The inspiration for this paper was given birth by a suggestion from the referees of a paper titled “Generating Metadata to Study and Teach about African Issues” in *Information Technology and People* (2014) Faleh Alshameri and I wrote. We had mentioned and briefly discussed the *Ubuntugogy* paradigm in that paper, which prompted the referees to suggest that we write another paper dealing with how metadata applications can be utilized to advance the paradigm. This paper is the outgrowth of their suggestion, without Alshameri who did not show much interest in doing so. The paper is divided into three major sections and a conclusion. The first section introduces the subject being examined. The second section entails a summary of the presuppositions and requirements for *Ubuntugogy* as illustrated in my works on the subject for those readers who may not be familiar with the paradigm. The third section proposes metadata applications to advance the paradigm. The paper is important because as Alshameri and I have demonstrated, the capabilities of generating and collecting data have been increasing rapidly. The computerization of many business and government transactions with the attendant advances in data collection tools has provided huge amounts of data. Millions of databases have been employed in business management, government administration, scientific and engineering management, and many other applications. This explosive growth in data and databases has generated an urgent need for new techniques and tools that can intelligently and automatically transform the processed data into useful information and knowledge. An *Ubuntugogy* metadata mining approach can therefore prove to be quite useful in advancing African-centered Internet literacy.

Introduction

As I did in my book titled *Toyin Falola and African Epistemologies*,¹ I must begin by stating here that the theoretical postulates upon which the discussion in this paper is grounded can be found in my articles titled “Ubuntugogy: An African Educational Paradigm that Transcends Pedagogy, Andragogy, Ergonagy, and Heutagogy” and “Pedagogy and Foreign Language Teaching in the United States: Andragogy to the Rescue.”² I also must add that the theoretical renderings here are relatively brief; thus, the interested reader can consult the cited book and articles for details.

The immediate question that arises here is the following: What do these paradigms mean? As I have defined them in my writings, *Ubuntugogy* is “the art and science of teaching and learning undergirded by humanity towards others.”³ Therefore, as I also argued, the salvation of African people hinges upon employing indigenous African educational paradigms that can be subsumed under the rubric of *Ubuntugogy*, which “transcends *Pedagogy* (the art and science of teaching), *Andragogy* (the art and science of helping adults learn), *Ergonagy* (the art and science of helping people learn to work), and *Heutagogy* (the study of self-determined learning).”⁴

Thus, my major objective in this paper is to show that there are alternative epistemologies to the Western variety. Data are organized differently; the use of data is subject to an agenda in relation to the definition of society, and people imagine data's future use in various ways. While not dismissing Western knowledge, the paper validates indigenous African ways of thinking.⁵

As I argue in the preceding works, after almost three centuries of employing Western educational approaches, many African societies are still characterized by low literacy rates (based on Western standards), civil conflicts, and underdevelopment. It is obvious that Western educational paradigms, which are not indigenous to African people, have to be questioned. At least two major questions emerge: (1) Why have Western educational systems yielded limited benefits for a large number of African people? (2) Did Western educational systems infiltrate African societies because African people lacked their own?

In response to the first question, I point out in my works that as Kofi Nyidevu Awoonor argues about African political systems and as I argue similarly about African educational systems, Western structures are incompatible with African systems because the former are based on a concept that fractures African life. They are based upon a Eurocentric division of labor theory that divorces education from politics, religion, economics, and the social institutions of family, group, or people. This fragmentation theory results from Eurocentric epistemology and an intrinsic approach to subsistence that has its beginnings in Greco-Roman and, subsequently, Judeo-Christian thought.⁶

To the second question, I state in my writings aforementioned that many African people, including the educated ones, continue to live in two worlds: the traditional and the modern scientific. When modern hospitals fail to cure a disease, the patient goes to the traditional doctor. In fact, some people know which disease to refer to which doctor.⁷ In sum, Christianity, colonialism, and Western education have failed to completely uproot the African from his/her cultural world. The people who live in these two worlds are often confused because both worlds seem to yield appropriate fruits. Consequently, a new culture has emerged: it is a mixture of the African culture and the European culture. It is to this new culture that *Ubuntu*gogy as an African educational paradigm can respond positively.

Presuppositions and Requirements for *Ubuntu*gogy

The presuppositions and requirements for *Ubuntu*gogy become abundantly evident when the paradigm is contrasted with its counterparts mentioned earlier. Also, as I stated before, the discussion here is drawn from my works adduced in the introductory section of this paper. As I recount in those works, public administration specialists Danny Balfour and Frank Marini have done an excellent job in summarizing the fundamental distinction between *Pedagogy* and *Andragogy*. Some aspects of the discussion in this section draw from their analytical framework.⁸

For many decades now, some adult education specialists have employed the term *Andragogy* to describe the philosophy, principles, and practices that they have found most useful in dealing with the special learning needs and attributes of adult learning, as unmistakable from *Pedagogy* (an approach to education that assumes student-as-child). In 1985, Joseph Davenport and his colleagues grappled with the controversial issues surrounding the concept of *Andragogy*, including differing philosophical orientations, the classification of *Andragogy*, and the general relevance of the term “adult education.” They also looked at the exceptive spotlight on teaching and learning and discerning variations between *Andragogy* and *Pedagogy*.⁹ Indeed, as Popie Marinou Mohring has pointed out, the derisive meaning attributed to *Pedagogy* as a mechanism used to teach children who are devoid of knowledge or understanding in general subverts its earlier and entrenched meaning, which did not focus solely on children or accentuate the peculiarities imputed to it in the *Andragogy* literature.¹⁰

Despite the shortcomings of the way the *Pedagogy* concept has been treated in the adult education literature, the approach is not without justification. A great deal of evidence exists in education at all levels to support the claim that students are treated as lacking knowledge or awareness of the subject matter they intend to study. It therefore makes sense to treat the terms *Pedagogy* and *Andragogy* as the adult education literature has used them, like “pure types” or “ideal types” in the Weberian sense, or “models” as the concept is commonly employed in contemporary social science. This will allow one to view the two concepts as extreme positions on a continuum of approaches to teaching, where no one teacher’s approach is likely to be an unadulterated or complete example of either.¹¹

The basic difference between *Pedagogy* and *Andragogy* is that *Pedagogy* treats learners as passive and dependent individuals and *Andragogy* treats them as relatively autonomous and self-directed individuals. Education specialist Malcolm Knowles notes that much of what is commonly conceptualized as education and teaching is the outcome of attempts to transmit knowledge and culture to children under conditions of compulsory attendance.¹² Knowles and other scholars in the adult education domain, such as Barry Bright, Stephen Brookfield, and John Ingalls, see *Pedagogy* as a method that developed in such a context and that has inappropriately permeated all of education, including adult education.¹³ *Pedagogy*, then, is problematic for educating African people not so much because its assumptions may be oriented toward the learning needs of children as because they are associated with specific educational objectives and settings. Consequently, *Pedagogy* does not provide a comprehensive model for learning about African phenomena by either children or adults. 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 is taught by, or informed by, the former. *Pedagogy* assumes that the learner lacks relevant knowledge and experience and generally is incapable of determining the learning or educational agenda. As such, the agenda is to be set by the teacher or educational institution. This educational agenda, according to Brookfield, is based on subjects sequenced in terms of level of difficulty and the skill level of the learner.¹⁴

Pedagogy is familiar to most of us from at least part of our early school days. It probably can be effective and appropriate, given certain educational goals, participants, settings, and subject matter. Moreover, it can be applied to both children and adults. However, it cannot address every individual's learning desires and needs. Most adults, and even some children, cannot only learn various subjects from their teachers but also can take an active role in identifying and effectively pursuing their own learning agendas.

The basic assumption of *Andragogy* is that adults prefer self-direction in learning. As a learner matures and develops an autonomous sense of self, he or she tends to shun dependency relationships. This andragogic model, as presented by Ingalls, takes into consideration the autonomy of mature adults and their drive to continue the learning process. A corollary to this assumption is that the accumulated experience of learners is a valuable learning resource that should be integrated into the educational process. The learning content of *Andragogy* is determined by the learners in collaboration with their teacher or facilitator. This agenda calls for solving problems or pursuing interests in the learner's immediate environment.¹⁵

Several implications follow. The first of these, following Ingalls and Knowles, has to do with the power relation between teacher and learner. While *Andragogy* makes less of a distinction between teacher and learner, *Pedagogy* emphasizes a dominant teacher and a dependent and passive learner. The andragogic teacher acts like a facilitator or resource for the learner and also acts as an active learner in the process. In *Pedagogy*, communication is unidirectional: from teacher to learner. *Andragogy*, in contrast, encourages integrative learning.¹⁶

The second implication is that in *Pedagogy*, as Ingalls notes, the teacher unilaterally decides *what* is to be learned and *how* it is to be learned in the belief that the learners are incapable of identifying their learning needs. In *Andragogy*, the learners themselves directly and significantly influence the curriculum based on their interests and needs. The teacher facilitates learners in forming interest groups and diagnosing their learning needs. *Andragogy* allows learners to manage and direct this collaborative process.¹⁷

Finally, as Knowles, Ingalls, and Brookfield maintain, *Pedagogy* treats education more in terms of preparation for the future than as a matter of doing in the present, which implies a distinction between the world of learning and that of doing. *Andragogy* assumes that learning is central to what it means to be human. Consequently, very little distinction is made between learning and doing, between education and everyday problem solving. *Andragogy* calls for identifying and solving problems in the present. It looks at the present situation and attempts to define and pursue concrete goals.¹⁸ In sum, the nature and outcome of an educational process will hinge upon the assumptions that educators hold about the abilities and needs of the learners.

Pedagogy can sensibly be employed if it is believed that students are dependent and passive and would not learn in the absence of steady direction from the teacher. However, *Andragogy* can sensibly be used when educators believe that students are basically autonomous, self-directed, and motivated to learn.

As Knowles reminds us, the assumptions educators hold about learners can become “self-fulfilling prophecies.” Learners in a pedagogic setting can become passive in the classroom largely because that is how they have been socialized to behave. Adults can grow ambivalent about becoming involved in the educational or training experience for fear that they will be treated as though they lack the maturity and experience to contribute to the learning process.¹⁹

Over the years, many of us have found the andragogic approach to be quite useful in a number of areas. These areas include foreign-language teaching, professional performance improvement, art education, ideology, cultural studies, learning opportunities, updates on adult learning theory, international business enterprises, library-use skills, faculty learning, theory building, academic writing and reading, and social responsibility.²⁰ Recently, however, a relatively small number of scholars have been quite critical of the andragogic approach. Anita Kaplan, for instance, argues that:

One of the main problems facing andragogy is that its systematic nature is more the result of theoretical deliberations not its own. Until the mid-nineteenth century, andragogy founded its development mainly on prevailing communal, social, economic, political and cultural conditions in various countries. In the 1950s, andragogy turned increasingly into a science with goals directed toward humans and their relationship to the world, a sphere in which practice is only the result of human’s “spiritual praxis.” Andragogy must now deal with the theoretical organization of its theory, historically perceive its achievements thus far, and become connected with other sciences to accelerate its own development and simultaneously acquire an identity of its own and an internal coherence as a science....²¹

Ralf St. Clair contends that, contrary to Knowles’ claim that *Andragogy* is the art and science of teaching adults, the approach is not about gaining knowledge. For St. Clair, “the assumptions demonstrate how the theory lays out a humanist view of learners and their potential for growth, with implications for teaching, social philosophy, and human relationships.”²² As such, he believes that andragogy is an approach to the education and development of adults strongly rooted in the disciplinary needs of adult education in the 1960s, but it provides little insight into learning beyond a set of assumptions about learners. In addition, he argues that Knowles’ assertion that *Andragogy* could be employed at any adult learning setting notwithstanding, it is imperative to recognize the fact that the approach only addresses certain types of learning at certain times. St. Clair further asserts that *Andragogy* cannot claim that it should be distinguished from adult education as a field because the approach does not provide a clear delineation between the education of children and that of adults and adult education and human resource development. Thus, he concludes that “in the future, andragogy will maintain its role as a necessary component of the field’s shared knowledge, but it is highly unlikely to be perceived as sufficient to explicate or shape the education of adults.”²³

In addition, John Rachal argues that “the efficacy of andragogy is inconclusive and affected by definitional confusion.”²⁴ He then suggests that “analysis of research on andragogy yields the following seven criteria for an operational, consensus-based definition: (1) voluntary participation, (2) adult status, (3) collaborative determined objectives, (4) performance-based assessment, (5) measurement of satisfaction, (6) appropriate adult learning environment, and (7) technical issues.”²⁵

A few scholars have developed new approaches to augment the pedagogic and andragogic ones. In the first of their two essays, Kazutoshi Tanaka and Michael Evers coined the term *Ergonagy* from the Greek *ergon* (work) and *agogos* (lead), to describe concepts associated with education and training related to preparation for and performance of work. Combining the definition of *Pedagogy* as the art and science of teaching and that of *Andragogy* as the art and science of helping adults learn, Tanaka and Evers suggest that the both provide a basis for addressing the question of whether *Ergonagy* can be considered a component of education and, thus, provide “a clearer and more universally accepted concept of occupational-vocational education and training for better international dialogue, research, and comparative studies.”²⁶

In their second essay, Tanaka and Evers argue that “although the Japanese term *kyo-iku* is translated into English as ‘education,’ significant differences exist between the two terms.”²⁷ They believe that “ergonagy can help to integrate the Japanese concept of *kyo-iku* and the Western concept of education,” because “ergonagy supports a continual blending of academic and vocational education for improved work opportunities throughout individuals’ lives, whether in one or several careers.”²⁸ They also suggest that, “because it subsumes andragogy and pedagogy, ergonagy can make clearer and more defined international dialogue, research, and studies of *kyo-iku* and education.”²⁹

Chris Kenyon and Stewart Hase argue that “while education has traditionally been seen as a pedagogic relationship and andragogy has provided many useful approaches for improving educational methodology and has been accepted universally, andragogy still connotes a teacher-learner relationship.”³⁰ They add that “because of the rapid rate of change in society and the information explosion, educators should now be looking at educational approaches where learners themselves determine what and how learning should occur.”³¹ They then offer the concept of *Heutagogy*, defined as “the study of self-determined learning, as a natural progression from earlier educational methodologies that may well provide the optimal approach to learning in the twenty-first century.”³² *Heutagogy*, they further argue, would “(a) allow students to work as troubleshooters, problem solvers, and general consultants in charge of improvements; (b) allow recognition of the critical importance of learners in all aspects of the learning process; and (c) allow educators to help learners remember how to learn, develop confidence in their perceptions, and learn to question their interpretations of reality within a framework of competence.”³³

As I assert in my works mentioned earlier, *Ubuntugogy* transcends *Pedagogy*, *Andragogy*, *Ergonagy*, and *Heutagogy*. As the art and science of learning and teaching that is undergirded by humanity toward others, *Ubuntugogy* hinges upon the African philosophy and way of life called *ubuntu*—a word from the Southern African Nguni language family (IsiNdebele, IsiSwati/IsiSwazi, IsiXhosa, and IsiZulu) meaning humanity, fellow feeling, or kindness.³⁴ *Ubuntu* serves as the spiritual foundation of African societies. It is a unifying vision or worldview enshrined in the maxim *umuntu ngumuntu ngabantu*: that is, “a person is a person through other persons.” This traditional African aphorism articulates a basic respect and compassion for others, which can be interpreted as both a factual description and a rule of conduct or social ethic. It both describes the human being as “being-with-others” and prescribes what that should be.

I explicate that at least three major tenets of *ubuntu* can be delineated. The first major tenet of *ubuntu* rests upon its religiosity. While Western Humanism tends to underestimate or even deny the importance of religious beliefs, *ubuntu* or African Humanism is decidedly religious. For the Westerner, the maxim, “A person is a person through other persons,” has no obvious religious connotations. S/he will probably think it is nothing more than a general appeal to treat others with respect and decency. However, in African tradition, this maxim has a deeply religious meaning. The person one is to become “through other persons” is, ultimately, an ancestor. By the same token, these “other persons” include ancestors. Ancestors are extended family. Dying is an ultimate homecoming. Not only must the living and the dead share with and care for one another, but the living and the dead depend on one another.

This religious tenet, I point out, is congruent with the daily experience of most African people. For example, at a *calabash*, an African ritual that involves drinking of African beer, a little bit of it is poured on the ground for consumption by ancestors. Many African people also employ ancestors as mediators between them and God. In African societies, there is an inextricable bond between humans, ancestors and the Supreme Being. Therefore, *ubuntu* inevitably implies a deep respect and regard for religious beliefs and practices.

The second major tenet of *ubuntu*, I state, hinges upon its consensus building. African traditional culture has an almost infinite capacity for the pursuit of consensus and reconciliation. African style democracy operates in the form of (sometimes extremely lengthy) discussions. Although there may be a hierarchy of importance among the speakers, every person gets an equal chance to speak up until some kind of an agreement, consensus, or group cohesion is reached. This important aim is expressed by words like *simunye* (“we are one”: i.e. “unity is strength”) and slogans like “an injury to one is an injury to all.”

I note that the desire to agree within the context of *ubuntu* safeguards the rights and opinions of individuals and minorities to enforce group solidarity. In essence, *ubuntu* requires an authentic respect for human/individual rights and related values, and an honest appreciation of differences.

The third major tenet of *ubuntu*, as I mention, rests upon dialogue, with its particularity, individuality and historicity. *Ubuntu* inspires us to expose ourselves to others, to encounter the differences of their humanness in order to inform and enrich our own. Thus understood, *umuntu ngumentu ngabantu* translates as “To be human is to affirm one’s humanity by recognizing the humanity of others in its infinite variety of content and form.” This translation of *ubuntu* highlights the respect for particularity, individuality and historicity, without which a true African educational paradigm cannot reemerge.

Furthermore, I point out that the *ubuntu* respect for the *particularities* of the beliefs and practices of others are especially emphasized by the following striking translation of *umuntu ngumentu ngabantu*: “A human being through (the otherness of) other human beings.” *Ubuntu* dictates that, if we were to be human, we need to recognize the genuine otherness of our fellow humans. In other words, we need to acknowledge the diversity of languages, histories, values and customs, all of which make up a society.

I maintain that *ubuntu*’s respect for the particularity of the other is closely aligned to its respect for *individuality*. But the individuality which *ubuntu* respects is not the Cartesian type. Instead, *ubuntu* directly contradicts the Cartesian conception of individuality in terms of which the individual or self can be conceived without thereby necessarily conceiving the other. The Cartesian individual exists prior to, or separately and independently from, the rest of the community or society. The rest of society is nothing but an added extra to a pre-existent and self-sufficient being. This “modernistic” and “atomistic” conception of individuality underscores both individualism and collectivism. Individualism exaggerates the seemingly solitary aspects of human existence to the detriment of communal aspects. Collectivism makes the same mistake on a larger scale. For the collectivist, society comprises a bunch of separately existing, solitary (i.e. detached) individuals.

Contrastingly, I argue, *ubuntu* defines the individual in terms of his/her relationship with others. Accordingly, individuals only exist *in* their relationships with others; and as these relationships change, so do the characters of the individuals. In this context, the word “individual” signifies a plurality of personalities corresponding to the multiplicity of relationships in which the individual in question stands. Being an individual, by definition, means “being-with-others.” “With-others” is not an additive to a pre-existent and self-sufficient being; instead, both this being (the self) and the others find themselves in a whole wherein they are already related. This is all somewhat boggling for the Cartesian mind, whose conception of individuality must now move from solitary to solidarity, from independence to interdependence, from individuality *vis-à-vis* community to individuality *à la* community.

In the West, I point out that individualism often translates into rugged competition. Individual interest is *modus vivendi*, and society or others are regarded as a means to individual ends. This is in stark contrast to the African preference for co-operation, group work or *shosholozza* (“work as one”: i.e. team work).

The *stokvels* in South Africa are approximated to be 800,000. Stockvels are joint undertakings or collective enterprises, such as savings clubs, burial societies and other co-operatives. The stockvel economy might be described as capitalism with *sazi* (humanness), or, put differently, a socialist form of capitalism. Making a profit is important, but never if it involves the exploitation of others. Profits are equally shared. Thus, stockvels are based on the *ubuntu* “extended family system”: i.e. all involved should be considered as brothers and sisters, members of the same family.

Indeed, I note, the *ubuntu* conception of individuality may seem contradictory, since it claims that the self or individual is constituted by its relations with others. But if this is the case, then what are the relations between? Can persons and personal relations really be equally primordial? African thought addresses this (apparent) contradiction in the idea of *seriti*: i.e. an energy, power of force which both makes us ourselves and unites us in personal interaction with others. This idea allows us to see the self and others as “equiprimordial” or as aspects of the same universal field of force. This distinctive African inclination towards collectivism and collective sense of responsibility does not negate individualism. It merely discourages the notion that the individual should take precedence over community.

Consequently, I point out, an oppressive communalism constitutes a derailment, an abuse of *ubuntu*. True *ubuntu* incorporates dialogue: i.e. it intertwines both relation and distance. It preserves the other in his/her otherness, in his/her uniqueness, without letting him/her slip into the distance.

Thus, as I maintain, the emphasis on the “ongoing-ness” of the contact and interaction with others on which the African subjectivity feeds suggests a final important ingredient of the “mutual exposure” mandated by *ubuntu*: i.e. respecting the *historicality* of the other. This means respecting his/her dynamic nature or process nature. The flexibility of the other is well noted in *ubuntu*. In other words, for the African humanist, life is without absolutes. An *ubuntu* perception of the other is never fixed or rigidly closed; rather, it is adjustable or open-ended. It allows the other to be, to become. It acknowledges the irreducibility of the other: i.e. it never reduces the other to any specific characteristic, conduct, or function. This underscores the concept of *ubuntu* which denotes both a state of being and one of becoming. As a process of self-realization *through* others, it simultaneously enriches the self-realization *of* others.

Thus, the essence of *Ubuntu-gogy* is that it is imperative and urgent for African educators to be concerned about broader education as well as training and to be concerned about approaches to learning and teaching that are undergirded by humanity or fellow feeling toward others. When *Ubuntu-gogy* is considered along with the idea of the socialization effects of educational environments and the possibilities of a reinforcement of these notions and contexts, the implications for an African educational process appear vital.

Metadata Applications to Advance *Ubuntugogy*

Some of the discussion in this section appears in the article by Alshameri and I mentioned earlier and three of my related articles, as they are the only ones, to the best of my knowledge, in which this subject has been explored. As Alshameri and I propose, following Berry et al., it is vital to know how accurate or correct a text retrieval system is in retrieving documents based on a query. The set of documents relevant to a query can be called “{Relevant},” whereas the set of documents retrieved is denoted as “{Retrieved}.” The set of documents that are both relevant and retrieved is denoted as “{Relevant} ∩ {Retrieved}.” There are two basic measures for assessing the quality of a retrieval system: (1) precision and (2) recall.³⁵

The precision of a system is the ratio of the number of relevant documents retrieved to the total number of documents retrieved. In other words, it is the percentage of retrieved documents that are in fact relevant to the query—i.e. the correct response. Precision can be represented as follows:³⁶

$$\text{Precision} = \frac{|{\mathbf{Relevant}} \cap {\mathbf{Retrieval}}|}{|{\mathbf{Retrieved}}|}$$

The recall of a system is the ratio of the number of relevant documents retrieved to the total number of relevant documents in the collection. Stated differently, it is the percentage of documents that are relevant to the query and were retrieved. Recall can be represented the following way:³⁷

$$\text{Recall} = \frac{|{\mathbf{Relevant}} \cap {\mathbf{Retrieval}}|}{|{\mathbf{Relevant}}|}$$

For example, a precision retrieval of documents with the concept *Ubuntugogy* itself via a general Google search on September 29, 2017 yielded about 5,070 results (any document that mentions the word *Ubuntugogy*) in 0.58 seconds. However, recall retrieval yielded in 0.44 seconds 708 documents that are relevant: i.e. results generated by using quotation marks around the term *Ubuntugogy* to tell Google to match it only to those documents that deal with the tenets of the paradigms. This represents a ratio of approximately 1:14—i.e. for every one relevant document, there were about 14 retrieved documents in the collection. Moreover, data mining of *Ubuntugogy* using the Mozenda software to retrieve relevant documents that deal with the tenets of the paradigm yielded 106 results.

Our proposed approach for mining massive datasets for studying Africa from an African-centric perspective depends on the METANET concept: a heterogeneous collection of scientific databases envisioned as a national and international digital data library which would be available via the Internet. We consider a heterogeneous collection of massive databases such as remote sensing data and text data.³⁸

Through METANET, Data Documentation Initiative (DDI) and OpenSurvey methodologies can be used to collect data in areas where the technological infrastructure is less developed and less consistent. DDI allows researchers to use XML-based tools, using open standards, to access extensive machine-readable textual descriptions of past surveys, and make them more readily available. OpenSurvey will make it possible for researcher to use survey software and open source software to generate data. The common tools the researcher can use through open survey are AskML, an XML-based metadata standard for a survey instrument, and TabsML, an instrument used to access crosstab reports.³⁹

Also, following Allert et al., humanistic approaches such as *Ubuntugogy* can provide unique benefits across a region. This is because these approaches allow a researcher to decipher self-reflexive, subjects as part of the context and personalities.⁴⁰

For researchers of African topics to be able to maximize the utility of this content-based query technique, there must exist a Web-based prototype through which they can demonstrate the idea of interest. The prototype must deal with different types of massive databases, with special attention being given to the following and other aspects that are unique to Africa:⁴¹

- (a) African languages with words encompassing diacritical marks (dead and alive).
- (b) Western colonial languages (dead and alive).
- (c) Other languages such as Arabic, Russian, Hebrew, Chinese, etc.
- (d) Use of desktop software such as Microsoft Word or Corel WordPerfect to type words with diacritical marks and then copy and paste them into Internet search lines.
- (e) Copying text in online translation sites and translating them into the target language.

The underlying approach must be pluridisciplinary, which involves the use of open and resource-based techniques available in the actual situation. It has, therefore, to draw upon the indigenous knowledge materials available in the locality and make maximum use of them. Indigenous languages are, therefore, at the center of the effective use of this methodology.⁴²

What all this suggests is that the researcher must revisit the indigenous techniques that take into consideration the epistemological, cosmological and methodological challenges. Hence, the researcher must be culture-specific and knowledge-source-specific in his/her orientation.

Thus, the process of redefining the boundaries between the different disciplines in our thought process is the same as that of reclaiming, reordering and, in some cases, reconnecting those ways of knowing, which were submerged, subverted, hidden or driven underground by colonialism and slavery. The research should, therefore, reflect the daily dealings of society and the challenges of the daily lives of the people. Towards this end, at least the following six questions should guide pluridisciplinary research:⁴³

- (1) How can the research increase indigenous knowledge in the general body of global human development?
- (2) How can the research create linkages between the sources of indigenous knowledge and the centers of learning on the continent and the Diaspora?
- (3) How can centers of research in the communities ensure that these communities become “research societies”?
- (4) How can the research be linked to the production needs of the communities?
- (5) How can the research help to ensure that science and technology are generated in relevant ways to address problems of the rural communities where the majority of the people live and that this is done in indigenous languages?
- (6) How can the research help to reduce the gap between the elite and the communities from which they come by ensuring that the research results are available to everyone and that such knowledge is drawn from the communities?

The prototype system will allow scientists to make queries against disparate types of databases. For instance, queries on remote sensing data can focus on the features observed in images. Those features may be environmental or artificial features which consist of points, lines, or areas. Recognizing features is the key to interpretation and information extraction. Images differ in their features, such as tone, shape, size, pattern, texture, shadow, association, etc.⁴⁴

Other features of the images that also should be taken into consideration include percentage of water, green land, cloud forms, snow, and so on. The prototype system will help scientists to retrieve images that contain different features; the system should be able to handle complex queries. This calls for some knowledge of African fractals, which have been defined as a self-similar pattern—i.e. a pattern that repeats itself on an ever diminishing scale.⁴⁵

For the text database, the prototype system must consider polysymy and synonymy problems in the queries. Polysymy means words having multiple meanings: e.g. “order,” “loyalty,” and “ally.” Synonymy means multiple words having the same meaning: e.g., “jungle” and “forest,” “tribe” and “ethnic-group,” “language” and “dialect,” “tradition” and “primitive,” “corruption” and “lobbying.” The collected documents will be placed into categories depending on the documents’ subjects. Scientists can search into those documents and retrieve only the ones related to queries of interest. Scientists can search via words or terms, and then retrieve documents on the same category or from different categories as long as they are related to the words or terms in which the scientists are interested.⁴⁶

Conclusion

As Alshameri and I mention in our article, and I also do in my three essays mentioned severally in the other sections of this paper, the main concept of automated metadata is creating a digital object and linking it to the dataset to make the data usable and at the same time the search operation for particular structures in the dataset easy to access. Thus, we suggest that researchers should consider scalability when working with a massive dataset.⁴⁷

We add that data mining techniques and visualization must play a pivotal role in retrieving substantive electronic data to study and teach about African phenomena in order to discover unexpected correlations and causal relationships, and understand structures and patterns in massive data. In light of all these possibilities, we suggest that it is imperative that there be on-the-ground commitment on the part of implementers, as well as university and government authorities, in order to achieve adequate and sustainable information communication technologies (ICTs) in Africa. We note that only through their participation will the Internet transform the classroom, change the nature of learning and teaching, and change information seeking, organizing and using behavior.⁴⁸

Indeed, as I suggested earlier and in many of my other writings, the provision of education in Africa must employ *Ubuntu*gogy (which I define as the art and science of teaching and learning undergirded by humanity toward others) to serve as both a given and a task or *desideratum* for educating students. *Ubuntu*gogy is undoubtedly part and parcel of the cultural heritage of African people. Nonetheless, it clearly needs to be revitalized in the hearts and minds of some African people. Although compassion, warmth, understanding, caring, sharing, humanness, etc. are underscored by all the major world orientations, *ubuntu* serves as a *distinctly African rationale* for these ways of relating to others. The concept of *ubuntu* gives a distinctly African meaning to, and a reason of motivation for, a positive attitude towards the other.

In light of the calls for an African Renaissance, *Ubuntugogy* urges African people to be true to their promotion of peaceful relations and conflict resolution, educational and other developmental aspirations. We ought never to falsify the cultural reality (life, art, literature) which is the goal of the student's study. Thus, we would have to oppose all sorts of simplified or supposedly simplified approaches and stress instead the methods which will achieve the best possible access to real life, language and philosophy.

Endnotes

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