

LANGUAGE ACQUISITION SKILLS: A NECESSARY GATEWAY TO SCIENCE AND TECHNOLOGY EDUCATION, CHALLENGES FOR THE 21ST CENTURY

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Abstract

Language is indispensable in the life and existence of man as an individual as it makes communication and interaction possible. Success in science and technology cannot be possible without a functional language used for educational instructions. There is the need however, to be fluent and proficient in the use of the language as a means of communication. This can only be achieved if users have acquired the various skills and rudiments of the language. There is in fact, no way can we successfully combat the challenges posed by science and technology education without the acquisition of appropriate language skills. (This is because it is only with language that one verbalizes and interprets scientific concepts which the society requires so much) Accordingly, this paper examines some of the ways through which the skills and rudiments of the language should be acquired. Factors militating against the acquisition of language are discussed and suggestions for improvement are made.

Introduction

Language is most uniquely human. When we consider all the aptitudes or natural abilities and behaviour which characterize animate beings, language is the most distinct. The capacity to acquire and use language is a quality which distinguishes human beings from all other creatures. In the development of an individual as a social being, language is invariably, but unarguably *a primus inter pares*. The ability to think and carry out our thoughts is possible because language exists. It offers an individual the necessary potential and capacity to function as a social man. Accordingly, Halliday (1978:10) asserted that the “existence of language implies the existence of man”.

Language is the medium through which man becomes a personality. Without the existence of language, man would be little less than a beast. This assertion is true as language makes expression possible and communication easy. Words are the vehicle of thought. However, without an appropriate language, utterances will be totally impeded. In the development of a man as a social being, language plays a central role. All the developmental efforts of man revolve around language. Formal and informal upbringing of a child are possible because of the existence of language as a means of communication.

Invariably, it is the recognition of the monumental roles and functionalities which language plays in the upbringing of a child, on the one hand, and its indispensability in all human activities on the other that Nigeria, in her

philosophy of education sees language as a *sine qua non* in all aspects of a child's development, including education. It is for this reason that the *National Policy on Education* (2004: 11) stresses the use of the mother – tongue or the language of the immediate environment in the early years of a child's training and the use of English Language at a later stage. This policy is in consonance with Halliday's view that language is the only instrument with which educational instructions for the development of a child are imparted when he opines that Language is the channel through which the patterns of living are transmitted to him, through which he learns to act as a member of a society.

Language exerts so much influence in all human endeavors, providing solutions to the numerous problems facing man. Consequently, language implements, acts, influences and in fact, does all there is to be done. For instance, there are many varieties of language and dialects which enable one to express multiplicity of views, literature and ways of life.

Apparently, attempts to appreciate the importance, versatility and functionality of language reveal that people can only see as language allows them to see. Should we decide to explore the thoughts and activities of our predecessors, it is only language that can make this possible. On the same hand, when one looks forward in time, and finds out that one can plan only through language. To look outward in space and send symbols of communication or even explain whom one is, should there be anyone who cares to know, one takes recourse to language.

Consequently, the impact of language has affected studies in such disciplines in the social sciences as Psychology, Sociology and Anthropology. Thus Gleason (1975:10) opined that scholars in these courses of study have seen the need to investigate language as a form of human interaction. For instance, the desire to know and master English Language makes a scholar to study its systematic internal structures, its creative potentials, its ability to refer to abstraction and imaginary objects, and its ability to talk about itself, etc. It is in the light of this that the focal point of this paper is language acquisition, language learning, functions of language and the place of language in Science and Technology in the 21st century. The paper further discusses the factors militating against language learning and acquisition. It concludes by making suggestion for improvement.

Language Acquisition

Language acquisition and language learning are two recognized different processes. Language acquisition often refers to that inborn ability that an individual has in acquiring his mother – tongue or native language. This applies more appropriately to a first language situation with which an individual makes his first contact. Language learning on the other hand, applies more to the second language which an individual has to learn. It has been observed however, that in

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a sufficiently conducive environment, children can acquire knowledge of the second language without formal classroom situation or training.

Commenting on this, William (1990:18) noted that some aspects of the second language (especially, the complex ones) will never be learned or acquired in the classroom especially, when it forms the medium of communication. Thus, language learning is a process brought about in a setting where subject matter is selected and graded, and activities organized to promote use of the language. For this reason learning process is not deeply integrated in the instructional setting, unlike in the natural setting where there is no inhibition or limit to exposure between language acquisition and language learning. The two are believed to be complementary to each other.

It is popularly believed that girls learn to speak more rapidly than boys. According to Crystal (1987:19) several researchers have shown that girls are linguistically superior at early ages than boys. Adetugbo (1979:15) supported this view when he writes that Gleitman and Gleitman's finding reveals that girls are usually minimally in advance of boys in their language development. Differences are found due more to the ways in which boys and girls are brought up rather than the physiological and genetic factors.

Acquiring a language involves two distinct skills: The ability to produce speech in a spontaneous way and the ability to understand the speech of others. The former is relatively easy to study. All one needs is to turn a tape recorder on and analyse what comes out. Research into speech comprehension is far more difficult because one needs to take into account, not only what is spoken to the child, but the situation in which it is uttered and the child's prior knowledge of the word. Echoing Jean Piaget, Routledge and Paul (1972:52-127) observed that children acquire language more rapidly within the first 18 months than in the later stages of their life.

Invariably, they contend that by the age of five, most children correctly identify themselves and others by sex. They also behave as members of their sex are expected to behave in the society. As they gain language and cognitive skills, children hear themselves called "boy" or "girl". They observe what boys and girls do, accept the labels and behave accordingly. This acceptance is termed "identity taking". Once the basic ground rules have been learned, labeling by others and identity taking by the individual act together to transmit traditional roles. Throughout life, the individual takes on a number of identities and learns the requirements of various roles.

By choosing a model such as sports hero or an admirer; a young person generally begins to learn how to be independent from family or peers and also forms meaningful relationship. He gains a self- chosen identity that is valued by others and contributes to self esteem. Through the model, behaviour takes on personal meaning and becomes something more than conforming to conventional norms.

Innate Ability: Children are born with an innate capacity for language development. The human brain is ready for language when children are exposed to speech. It is during this period that certain general principles for discovering or structuring language automatically begin to be in operation. These (innate ability) principles constitute what Routledge and Paul (1972:146) cited Chomsky who called it (innate ability or capacity) “Language Acquisition Device (LAD). With the use of this linguistic equipment, a child makes sense out of the utterances heard around him, deriving from this primary linguistic data. They further posited that Chomsky, (see Routledge & Paul: 127-128) an American Psychologist argued that the “linguistic universal” ability of language learning and acquisition are parts of human “genetic endowment “. He argued that if this is not so, “how is it that a child equipped at birth with no communication skills whatsoever, but only with the rudimentary verbal repertoire for expression, is able to acquire an ability as complex as language and so reliably and regularly”.

Cognition: Cognitive awareness is essentially in children’s language acquisition and learning. An already essentially established cognitive foundation is important. Before a child can use structures of comparison, “this car is bigger than that” or “Peter is fatter than Paul”, he would have developed the conceptual ability to make relative judgment of size. This link has been clearly shown in the early period of language learning. Routledge and Paul (1972) asserted that Piaget calls this cognitive ability “sensori- motor” intelligence in which children construct a mental picture of the world objects that have independent existence.

The traditional common sense view is that comprehension always precedes production. Children need to understand a word or grammatical construction before they can use it. Imitation is a distinct skill in language learning. Often, children imitate sentence patterns that they are unable to produce spontaneously. They stop imitating the structure when they start to use them in their speech. This is more noticeable when new sounds or vocabularies are being learned. Imitation is thus a kind of bridge between comprehension and spontaneous production. Children learn speech in the popular way by copying the utterances heard around them and by having their responses strengthened by reactions of those around them.

The acquisition of the ability to use language is one of the most impressive pieces of learning that an individual achieves in the course of his life. This (mother-tongue/language of the environment) of course can affect both the mother-tongue and language of the environment. This is often the first language with which an individual makes his first contact. The second language has to be learned. Although English is seen in Nigeria today as the language of our conquerors, it is nevertheless regarded as a second language in the country.

Language Learning

Language learning is known to emanate from four main stages. These are listening, speaking, reading and writing. These four language skills are very

important in the acquisition of any language especially English. In fact, success in every academic endeavour revolves around them. This is because the success of learners at the tertiary institutions depends on their ability to read and write and competence in listening and speaking. In fact, the level of students' proficiency and competence they have acquired in these language skills, especially listening, speaking, reading and writing at the secondary school is inadequate to carry them through the tertiary level. This assertion is made on the understanding that much demand is made on each of these language skills at this stage of education. We cannot talk of any advancement in science and technology if our children, the students are deficient in these areas.

Listening Skill

Listening is a very important language skill. This assertion is made because what one speaks or writes is dependent on what he hears. It is for this reason that listening is seen as the first stage of language skills. It is thus very important to language acquisition, especially, English which is the main medium of educational instructions in Nigeria. Deficiency in this language skill leads to break down in communication and indeed, poor academic performance.

Consequently, a student who cannot listen effectively and attentively will find it hard to understand and interpret his lectures. Of course, we know that at the tertiary institutions, lecturing is one of the most important means of imparting educational knowledge to the learners. It is also known that at this level, every serious student spends more than three-quarters of his time listening to lectures and making notes. Therefore, for the listener to understand what is said, and respond appropriately, he must listen with concentration and attention. This is what James (1958) meant when he opined that listening is a selective process by which sounds communicated by some source are received, critically interpreted and acted upon by a purposeful listener. This can only be achieved through effective and active listening.

Purposeful or active listening calls for concentration and attentiveness which in turn, results in responsiveness. The understanding that active and purposeful listening is not easily achieved and that target audience often find it difficult to interpret or formulate meaning from what is heard make this paper look at this language skill as posing a serious challenge to science and technological education in the 21st century. Its acquisition and indeed appropriate application are conversely a necessary gateway for advancement in science and technology which the nation seriously needs.

Speaking Skill

Speech is another important language skill, second to listening. Both listening and speaking are technically referred to as oracy skill of the language as these are less complex to learn than reading and writing. This language skill is basic to all other language skills as it is the major medium of expression,

communication and interaction which are the goals of speaking. Generally, language is speech. Therefore, proficiency and functionality in any given language revolve around effective communication which manifests in speaking and writing. It is only through speaking that we externalize our feelings, thoughts and experiences.

Again, speech makes socialization possible. Every academic endeavour revolves around speaking and writing. For instance, it is the only channel through which learners ask and answer questions during lectures and clarifications are made through the same medium. Deficiency in this all important language skill poses a very serious set back in one's academic progress.

Reading Skill

This language skill is very important as it plays a major part in formal education. Of all the language skills, reading is very essential for mastering English as a second language. According to Joof, (1988) reading ability in whatever discipline should be seen as one of the key factors for general success in academic work at all levels. Reading is an important instrument for competence and proficiency in English. A student who suffers reading deficiency will not only be limited in his learning but also knowledge, and skill acquisition. Almost all the academic activities students do, either individually or in groups primarily depend on the extent to which they can read.

Reading, according to Troyka (1990) is an activity which involves interaction of the page, eye and brain, a meaning making interaction. This is contrary to a mere looking at words in print, a situation Troyka described as passive activity Troyka's view of reading is in consonance with that of Unoh (1989) who asserted that reading is a complex language processing behaviour that involves interpretation and meaning-making activity upon printed materials. Reading is in fact, the core of any language programme as it enhances language learning. It is not only employed as a tool for study, but also for creating awareness. The knowledge and education we acquire depend mainly on the quality and quantity of reading we do. Of course meaning-making reading is one that goes with comprehension.

It should be noted that the computer and other allied technologies are meaningless without meaning-making reading or reading with comprehension. With effective reading, the modern man finds it possible to reach and elicit more information, using computer. We talk of the world as a global village in which information around the world are reached and linked within few seconds through computer technology. However, this is impossible without effective and purposeful reading. We can communicate with the rest of the world through e-mail, mailing list, internet and other electronic communication devices, a situation which gives rise to Information Communication Technology (ICT). The availability of these ICT services are meaningful because we have acquired

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appropriate reading ability. Lack of this basic language skill makes one almost ineffective and malfunctional.

Reading serves as a means of information acquisition. Students obtain information from textbooks and other printed materials through reading. Being able to read is not only a condition for academic success, but also a gateway to science and technological education which consistently poses a challenge even in this 21st century.

Writing Skill

Writing as an important language skill is the representation of the spoken on paper. As a means of communicating one's thoughts, feelings and experiences, writing is of paramount importance. For the students, writing is an important academic tool as it is the medium through which class tests, assignments, term papers, seminars, conferences, workshops and examinations are carried out. It is also the medium through which research findings, laboratory experiments and results, new inventions are disseminated to the public. In other words, writing is the use of language in its written form to express thoughts and emotions. Through it, a writer not only communicates to the reader, but also narrates events, describes scenes, and explains a process. Perhaps, the functions of writing as a language skill include information dissemination, entertainment, mobilization and education.

Invariably, without writing as a language skill, nobody can talk of history which is a document of past events. Also, without writing, dissemination of news or information through print and electronic media cannot be possible. What is received as daily news or information in Nigeria today through print and electronic media derives from continuous writing processes which revolve around pre-writing stage (preparation/gathering information materials or data), the writing and re-writing stages to reshape and make necessary corrections and ensure that the grammar is appropriate for the occasion. All these are necessary in ensuring effective communication at this level. In fact, what can one do without writing? The answer is nothing. Our efforts in science and technology education cannot succeed without apt and effective writing skill. What is ICT if not reading and writing new technological findings and advancements. Really, the key to growth in science and technology revolves around writing and reading efficiencies. Through these, we can learn all there is to learn and react accordingly.

Functions of Language

Ordinarily, one makes conscious use of language when one wants to communicate ideas, tell people about oneself, circumstances, experiences or ask for information about others. In the same way, people use language to exchange facts and opinions. According to Halliday (1978: 48-50), the use of language involves purposes such as "referential, propositional and ideational".

Continuing, Halliday expatiated that one of the commonest uses of language is as a means of getting rid of our nervous energy when we are under stress. He asserted that this is the clearest case of what is often called “emotive or expressive” function of language. One makes use of emotive language both consciously and unconsciously. For instance, swear words and obscenities which are often uttered when people are angry or frustrated are emotive language. In deed, our voluntary verbal reactions to beautiful arts or scenery, expression of fear or affection as well as the emotional outpouring of certain kinds of poetry *inter-alia* are emotive utterances of positive kinds.

Furthermore, language is also used for the purpose of recording facts. All kinds of record keeping such as history, geographical survey, business accounts, science reports, parliamentary acts, public data, etc depict the function of language. This is in fact, different from that used in everyday conversation. Verbal language is used as instrument of thought, mental work and mathematical calculations.

Language is used for the expression of identity. Our use of language can tell great deal about us. Information about our social background and personal data such as level of education, age, sex and personality can only be passed through language. Language also has a neutral or behavioural function as when used in thinking. This includes reasoning thinking evident in solving problems, telling stories, planning strategies, etc. Crystal (1987:19-22) describes this as “rational, directed and logical [and] proportional”. This kind of thinking is educative.

Language functions as social and ethnic identity. The various ways people participate in social structure, belong to many social groups and perform variety of social roles are possible through the use of language. The question of linguistic identity is strong in the case of ethnicity and nationhood. Perhaps this revelation accounts for why Egwim (2002: 164) saw language not only as “an instrument for communication”, but also “a symbol of social identity and an emblem of group membership and solidarity”. It is in the light of this that attempts to preserve ones language often leads to ethnic and political reactions which often result in the demand for self-government. Linguistic conflicts have in the past developed due to merging together of people of diverse socio-cultural and ethnic backgrounds.

The Place of Language in Science and Technology in the 21st Century

Language occupies very important place in the nation’s effort for advancement in science and technology. This assertion is made on the understanding that language provides solution to the numerous problems in science and technology, a key to national development. For instance, man thinks and carries out his thoughts with language. Really, man uses languages to do all he has to do. This is very true, as we can only see, act, influence and implement as far as language allows. No wonder Halliday (1978:12) asserted that language

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makes the social man what he is as “there can be no social man without language”. The existence of language implies the existence of a social man since language is the means whereby people communicate and interact.

Corroborating the indispensability and versatility of language in man’s daily endeavours, Crystal (1987:6-7) also observed that language covers all human activities and interactions without which survival will be difficult and existence impeded, if not impossible. The question that arises then is:

- (a) Can we talk of research of any sort without language?
- (b) How do we write and disseminate scientific findings and laboratory results?
- (c) With what language does one impart educational instructions and scientific knowledge to the students and young learners?
- (d) With what language and how fast can scientific knowledge and technological discoveries be passed to poor scientific and less technologically developed nations around the world for the people to imbibe or learn?

Indeed, the answers to these questions are very clear. Here comes the monumental functions of language as means of communication and interaction and thus, the importance of its acquisition. Considering the tripartite position which English Language occupies in Nigeria such as national, official and language of international trade and diplomacy, this discourse believes that it (English) answers all the questions including that of ICT which of course serves as the medium of dissemination. It is for this reason that language acquisition skills form the focal point of this discourse.

Consequently, effective excursions have been taken into the four language skills internalizing their importance, and indispensability to the development and advancement of science and technology, a challenge facing the nation in the 21st century. While listening (hearing) and reading are technically referred to as receptive language skills, speaking and writing are also referred to as productive language skills. The proper acquisition of these language skills and their appropriate application will enhance users proficiency and competence in the language. Deficiency in any of these language skills will result in poor academic growth and performance and conversely, acquisition of science and technological knowledge which the nation seriously requires for her growth and advancement in the area.

Naturally, the literacy skills of language, reading and writing are important in the nation’s march to science and technological development. Problem in these areas can render any activity in science and technology malfunctioning and inoperative. For instance, Fakunde (2001:12-16) criticized students inability to read functionally, arguing that this ineptitude has resulted in students persistent academic failure. For instance, reading and writing are pivotal to the acquisition and participation in science and technological knowledge, education and are functional to ICT activities. In fact they are the proof of

intellectuality. No wonder Nwoke (1993:11) observed that reading is a strategy used in equipping science and technology students to be able to verbalize the scientific concepts they possess. These language skills have been seen as indispensable tools that will make students and scientific researchers succeed in their academic endeavours in this 21st century where computer has made the world a global village.

Furthermore, the age of technology and knowledge explosion has made it possible for every one to strive to know how to read and write as career opportunity basically depends on these skills. These literacy skills enable one to come in contact with a wide variety of knowledge which one can either copy, modify or even adopt for future uses. These language skills also enable us to participate, share and benefit from educational research findings, scientific discoveries and inventions beneficial to man.

The importance of language and the acquisition of its skills cannot be over-emphasized in this era of information explosion. There is the growing need for us to share in the new discoveries in science and technology around the world so as to explore new ideas and expand our own wealth of knowledge. We can only do this through reading, writing, listening and speaking in English.

The understanding that the acquisition of language skills and their effective application hold the key to the nation's growth and development in science and technology is also shared by Okunnuga (1979:271). Considering the objectives of English for Science and Technology (EST), he declared that if Nigeria must attain her long cherished knowledge in science and technology, the following is imperative:

1. listening comprehension training in spoken science and technological English.
2. reading comprehension and reading training to the satisfaction of science and technological departments to facilitate intermediate study in science and technology;
3. the ability to speak scientific and technological English; and
4. the ability to write scientific and technological English.

In the light of the above, it has become apparent that student's deficiency and inability in these language skills are among the problems that pose serious challenges to science and technological education in the 21st century

Factors Militating against the Acquisition of Language Skills

Many factors militate against the learning and acquisition of language skills. One of these is inadequate language teachers. There is inadequate English Language teachers in most primary, secondary and even tertiary institutions in the country. This has grossly affected the teaching, learning and acquisition of language skills. The few available teachers often find it very hard to cover all the various parts of the language.

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Nonchalance is another serious problem which militates against the learning and acquisition of English. This problem does not affect only the students, but also the teachers. Some language teachers really do not take the teaching of English very serious. They are often engaged with and committed to issues outside their employment in attempts to raise more money to meet personal and family demands. The result is that the teaching of English is either given less attention or totally neglected. The teachers usually rush students through the courses to meet the requirements of examination. This always leaves learners totally unexposed, ungrounded and unrefined in the skills of the language.

The students themselves seldom show any sense of interest or seriousness towards the learning and acquisition of the skills and rudiments of the language. During English Language classes, some students are often seen engaging themselves in less important issues such as conversing, playing or even copying notes or solving problems in other courses or subjects. Others play truancy, absenting themselves from English classes. All these affect effective learning and acquisition of the skills of the language.

Lack of expertise and pedagogic skills affect learning and acquisition of language skills. By this, I mean lack of good knowledge of the subject and skill for imparting knowledge to the learners. This in fact, has been a serious handicap to effective teaching and learning of English. Research has showed that there is serious disparity between what a teacher knows and what he actually claims to know. In fact, some English Language teachers have shallow knowledge of the subject and its pedagogy. This goes a long way to affect what they teach to the students and their general performance.

There is lack of incentive to language teachers as government no longer encourages in-service training for language teachers. Conferences and workshops on language are no longer sponsored by the government. Language teachers often find it difficult to shoulder the financial burdens of attending conferences and workshops. The result is that the teachers are not exposed to new research findings on the teaching of English Language.

Suggestions for Improvement

- (a) There is the need for government to employ more qualitative English teachers who possess good knowledge of the subject and pedagogical skills. This will go a long way to improve the teaching and acquisition process.
- (b) As a way of checking non-challance and making language teachers have job satisfaction, the government should make the teaching of English more attractive through the grant of attractive incentives such as sponsorship of workshops and conferences on English, in-service training and scholarship to language teachers. Classroom language activities should be somehow monitored to ensure that they use effective

teaching materials so as to enhance language acquisition skills during lecture deliveries.

- (c) To ensure that language teachers to be employed possess appreciable expertise and pedagogical skills, they should be subjected to rigorous written and oral interviews. This will enable educational administrators engage teachers with proven abilities not based only on the certificates they cannot defend.

If all these are carefully but systematically implemented, the learning and acquisition of language skills will improve considerably. This will greatly enhance the efforts of serious language learners in their learning processes and consequently, learners expressive and productive performances are positively affected. Again, the nation's quest for scientific and technological growth and advancement will be in sight. Furthermore, Nigeria will effectively join the current march for globalization. In deed, all these will be in vain without effective language policy that will ensure success in the learning, acquisition, knowledge and mastery of English Language as a medium of communication and educational training.

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