INTERDISCIPLINARY JOURNAL OF AFRICAN & ASIAN STUDIES (IJAAS)
VOL. 9 NO. 3, 2023 (ISSN: 2504-8694), Indexed in Google Scholar (EMAIL: ijaasng@gmail.com)
NNAMDI AZIKIWE UNIVERSITY, AWKA, NIGERIA

# *INTERDISCIPLINARITY* IN INFORMATION TECHNOLOGY, BIOLOGY AND LINGUISTICS: CORRELATION ANALYSIS AND THEORETICAL INSIGHTS

**Similoluwa Blossom Adesuwa Okpeseyi**
15291 NE 40th Street Redmond, WA 98052, USA
okpeseyi.simi@gmail.com
&
**Nwode, Goodluck Chigbo, PhD**
Department of Languages and Linguistics, Ebonyi State University, Abakaliki, Nigeria
goodluck.nwode@ebsu.edu.ng
&
**Anyanwu, Edith Ada, PhD**
Department of Languages and Linguistics, Ebonyi State University, Abakaliki, Nigeria
eanyanwu44@gmail.com

## Abstract
The existential correlation among information technology (IT), biology and linguistics is seldom considered by many scholars and other individuals. This study concisely analyzes the correlation among information technology (IT), biology and linguistics. It relied on secondary data and observation. The claims of the study are given credence by the theoretical postulations of the theories of Systemic Functional Linguistics and the Theory of Structural Functionalism. The theories reflect the thematic concerns of the study and justify the claims of the present study. The analysis shows that IT correlates with biology and linguistics, while information, science and methodological naturalism correlate with IT, biology and linguistics. The study concludes that the correlation and interdependent functionality existing among the three fields have existential and epistemic bearings, theoretical groundings, and practical realizations. The study charges scholars in the three fields to consistently research into the interdisciplinary features and realities of their disciplines in order to attain a more meaningful interdisciplinary collaboration, and better exploits.
**Keywords: Interdisciplinarity, Information technology, Biology, Linguistics, Correlation**

## Introduction
Information technology (IT) is needed for various uses and purposes, including for both biological and linguistic studies. Similarly, to study the biology of language, much more than the current knowledge of biology is needed. Biolinguistics is that special type of linguistics needed to go beyond the current biology (Sin categoría, 2018). This study avers that the three phenomena and disciplines largely share more of covert than overt features. Thus, many people seem to be ignorant of the reality that there is an existential correlation among them. This study is an attempt to create awareness about their correlation and rouse deserving attention to interdisciplinary collation imperative among the professionals of the three disciplines. It holds that the three fields (information technology, biology and linguistics) correlate significantly. The connectivity among them has functional bearing, a bearing to structural functionality of integral parts of a whole society system. In education, these three are separate entities, systems or phenomena that correlate and function interdependently for the good of all in the one whole system– education. This is upheld in by Moheb's (2021) study, which demonstrates a theoretical analysis of the integration of IT into systems of education.

Given the above, this study rises to dissect the correlation among information technology, biology and linguistics. In the course of dissecting the correlation, the study will descriptively situate information technology in both biology and linguistics. In other words, it will show IT as joiner of the two, biology and linguistics. Besides, it will show that linguistics connects IT and biology in terms of language use and shared thematic concerns. This is because the two disciplines make use of language. Interestingly, language is the thrust of linguistics. Di Sciullo et al. (2010) affirm that language has a biological nature. That is additional to other kinds of its nature, which make linguistics a multidisciplinary field. The correlation among them shall be dissected descriptively, highlighting the base of their correlation. The aim of this study is to dissect the correlation among information technology, biology and linguistics. The specific objectives are to show how IT, biology and linguistics correlate, analyze the correlation, and determine how one three serves as the base of the correlation.

**Concept and Scope of Information Technology**

Information technology (IT) describes information production, storage, processing, usage, analysis, dissemination and consumption, which involve the use of technologies like computers, computerised devices, the internet, etc., which together form the new media (Nwode, 2022). It is also regarded as information and communication technology (ICT). The demand for information is on the high increase, as it is realised that "the growing complexities of present day society and the increasing demands for information, referral services, a new dimension" (Haruna&Oyelekan, 2010, p. 16). The importance of information is expressed by Zwangobani (1987), who is of the view that information represents power in both economic and political fields. Thus, IT has an appreciable place in economic and political fields.

Technology refers to either a technology-based medium or media of communication (Lievrouw& Livingstone, 2002). McLuhan (1964) has argued that technology (medium) is more valuable to the society than the content of the message. The content of the message is the information. Communication is the exchange of information, feelings, etc. between a speaker and a listener (Ndimele, 1999). According to Anjugu (2013), technology includes the blogs, picture sharing, music sharing, crowd sourcing, e-mail, instant messaging, and voice record. All these components of technology obtain on social networking sites (SNSs). Among these social networking sites, social media are the most predominant ones (Anjugu, 2013).

Boateng and Amankwaa (2016) define social media as a vast collection of internet-based and mobile services, whereby heterogeneous users connect from different distant places to interact, communicate, discuss and exchange ideas, thoughts, feelings, information, knowledge, etc. on an online community. As Nwode (2022), Onuh (2022), Eze and Ogbaga (2019), Luhamya et al. (2017) and Edogor (2012) indicate, social media are used by students for chatting and relating with friends, downloading music, sending online comments on various issues, group communication and interactions, and self-learning and doing of academic tasks given to them by teachers. Social networking sites (SNSs), including social media, make up the new media. SNSs have significantly transformed the ways people think, act and do things socially, politically, educationally and otherwise. New media have their peculiar technologies quite different from those of the old or traditional media (Nwode, 2022; Nwode et al., 2019; Osuchukwu, 2012).

The technologies of the new media include internet, multi-media, portals, mobile phones, gaming, animations, portals, etc. According to Ravi (2012), "these technologies have millions of users in over 200 countries, and have greatly impacted on communication, creativity,

cognition, education and culture" (p. 480). The users include (information) technologists, linguists and biologists, among other professionals. The usage highlights the relevance of information technology in linguistics, biology, and other human endeavours. To that end, this study argues that IT links biology and linguistics, just as linguistics links both IT and biology in terms of all that concerns language use in the two fields.

Just as scholars confirm that IT is of great benefits to various fields (Ta, 2014; Bonsu et al., 2013; Mansell, 2004; Davis, 1987), this study argues that IT is equally of great benefits to linguistics and biology. The simple reason is that IT has been transforming, expanding, innovating, and repositioning biology, linguistics and other fields. Its impact on life, language and professionalism presents different benefits (Temur, 2020; Eze&Ogbaga, 2019; Coleman et al., 2016; Aktaruzzaman et al., 2011; Keengwe et al., 2008). IT has made teaching and learning better, flexible, easy, innovative, more critical, creative and productive, research oriented, and driven by audio-visual electronic devices (Temur, 2020; Eze&Ogbaga, 2019; Aktaruzzaman et al., 2011). According to Keengwe et al. (2008), the application of multi-media technologies in teaching and learning guarantees a very productive, interesting, motivating, interactive and quality delivery of classroom instruction, while at the same time addressing the diverse needs of the learners. Multi-media technologies include those technology-based devices that combine text, graphics, video, animation and audio (Nwode, 2022; Ravi, 2012).

**Concept and Scope of Biology**

Etymologically, biology is derived from two Greek words 'bio' and 'logos', whereby 'bio' means life, while 'logos' means study. It is the study of life and organisms. Living organisms are plants, animals and microorganisms. These organisms are studied along with their biological processes, functions and importance to the environment. Biology is also regarded as life science or biological sciences. Pierre-Antoine de Monet and Jean-Baptiste de Lamarck coined the term 'biology' in the late 1700s. Initially, biology concerned Botany and Zoology in the pure science. With new technologies, biology now extends to applied sciences that include the comprehensive study of living and non-living organisms, physical characteristics and behaviours of living organisms, living cells, chemical substances, ecosystems, environment (nature), environmental changes and challenges, reproductive system, human brain, and the composition of our genes, among others (Betza, et al. 2022; Bhatia, 2021).

Again, biology is a scientific field that focuses on the study of living things, including plants, animals, and microorganisms, as well as their biological activities and the impact they have on the environment. It is also known as the study of all living things and how they interact with their surroundings. By uncovering the mysteries of living organisms by carrying out research, Biology is a study of life and living beings, be it humans, animals or plant communities. The scope of biology is very broad. It includes all aspects of life ranging from the molecular stage to internal structures and organization of the living organisms. It also has language IT and linguistics as its componential fields that make some of its undertakings possible. For example, without language, nothing can be communicated meaningfully about biology, IT, sciences and other fields. That is why all human endeavors rely on language for different kinds of communication. Also, a whole lot of discoveries, inventions, deals, feats, etc. in biological sciences have been possible only with the use of IT. It follows that without IT in place, such biological feats and innovations would not have been in place (Betza, et al. 2022; Kuppuswamy and Narayan, 2010). Examples include technology-assisted reproduction processes, genetic engineering, plastic surgery, telemedicine, etc.

Biology is a science. Science includes diverse fields, such as biology, computer sciences, astronomy, geology, logic, physics, chemistry, mathematics, and lots more. Biology or biological sciences include biological technology, environmental studies, forensic science, microbiology, pharmacy, biotechnology, veterinary medicine, medicine and surgery, nursing, dietetics and food science, nutrition, biochemistry, genetics studies and engineering (Mondal, 2019). Some others are biomedical sciences, life sciences, molecular biology, cryobiology, astrobiology, ornithology, parasitology, socio-biology, neurobiology, clinical chemistry, histology, bacteriology, zoology, biomedical engineering, and neuroinformatics, to mention but a few (Betza, et al. 2022).

**Concept and Scope of Biolinguistics**

According to Sin categoría (2018), biolinguistics is not a mixture of biology and linguistics or an application of biology to the study of language. Rather, it is the name given to that area of linguistics that forms a part of natural science. In other words, biolinguistics belongs to the discipline that studies human languages from the viewpoint of natural science (Martins, &Boeckx, 2016; Lenneberg, 1967). By implication, biolinguistics is an abstract layer of the biology of language. It is a decisive step for the integration of the study of language in natural science. The emergence of: the nervous system, the brain, the human brain, and the language faculty added huge amounts of additional special information (Crain et al., 2017). The essence is to feed into the fundamental equations of physics, and caused the subsequent emergence of disciplines that address these areas of complexity. These areas include neurobiology, psychology, linguistics, and other cognitive sciences (Mondal, 2019; Wu, 2014).

As Gell-Mann suggests, “the enterprise of science involves investigating those laws at all levels, while also working, from the top down and from the bottom up, to build staircases between them” (p. 112). Biolinguistics has both missions: investigating the “additional information” of language structure and, at the same time, contributing to the building of staircases in search of unification and principled explanation (Di Sciullo&Boeckx, 2011; Jenkins, 1997). The two main qualities that characterise biolinguistics as a science in relation to other types of linguistics are methodological naturalism and internalism. The concept of “methodological naturalism” simply means that biolinguistics is a kind of linguistics that uses the same methodology used by the natural sciences. McGilvray (2013) suggests that biolinguistics should be called “bio-chemico-physico-compulinguistics” (p. 46).

Nevertheless, it is still appropriate to call it biolinguistics, because Chomskyan linguistics postulates that language, the object of inquiry, is a natural cum biological object (Călinescu, 2012). Thus, biolinguistics is a natural science for several reasons. One, it is a natural science on the basis of using the same methodology with the natural sciences. Another reason is that language is a natural cum biological object. As Sin categoría (2018) agrees, whatever is associated with methodological naturalism is natural and biological; being what has biological foundations. As Chomsky (2000 & 2002) has argued repeatedly, language is a mental organ; the ‘mental’ is a part of the ‘real’, just like the ‘electrical’ or ‘chemical’, so that language is just another natural object. Chomsky’s intellectual commitment is to methodological naturalism (i.e., ‘the mental’ and ‘the physical’ must be dealt with using natural science) rather than to ontological naturalism (i.e., ‘the mental’ is part of ‘the physical’). In his words, “Unless offered some new notion of ‘body’ or ‘material’ or ‘physical’, we have no concept of naturalism apart from methodological naturalism” (Chomsky, 2000, p. 143).

According to Sin categoría (2018), it seems quite clear that the split between the sciences and the humanities is a manifestation of methodological dualism. Besong and Robert (2019) and Dibie and Robert (2014) are unanimous on the view that the situating of linguistics and philosophy in arts and humanities rather than in sciences by the ancient linguists and philosophers gave rise to the sentiments held and expressed these days about these disciplines being sciences. However, not every instance of methodological dualism is also an instance of ontological dualism. They are of the view that if the ancients had situated these disciplines in sciences, there would not have arguments about and against the fields being sciences. Asouzu (2017) echoes the importance of philosophy in various spheres of life viz: "philosophy has much to do with the resourcefulness with which we handle the changes [and challenges] we encounter in life" (p. 1). SimilarlyAlić (2010) notes,

> Philosophy has always relied on language as well as language medium [or media]; found validity in the grammar structure of sentences it suggested to be used as laws of thought– objective laws of everything that exists; and acknowledged the language medium, while at the same time negating the completeness of that medium' (p. 207).

Asouzu's (2017) words reflect the thinking that philosophy and linguistics ought to have been situated in the sciences proper. If that had been done by the ancients, the looming arguments on the scientific status of these fields would not have been in place. Alić's (2010) study highlights the existential correlation and interdependence between language and philosophy, just as in the case of linguistics, IT and biology. Again, many people think that issues bordering on language, consciousness, ethics or feelings belong not to the realm of the natural sciences, but rather than to the realm of human sciences. Nevertheless, even in the domain of modern cognitive science, it is not strange to discover that ontological naturalism, which almost everyone supports, gives rise to methodological dualism and not to methodological naturalism, as expected (Sin categoría, 2018). One major reason for the foregoing is "the inherent difficulty of the logical path from ontological naturalism to methodological naturalism" (Sin categoría, 2018).

**Concept and Scope of Linguistics**

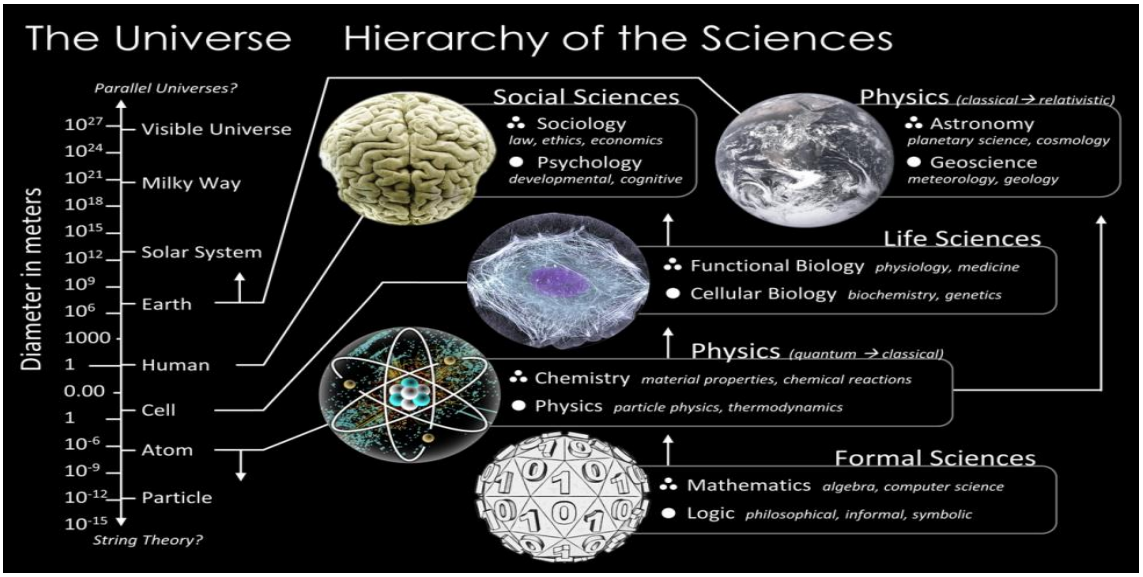
Linguistics is generally defined simply as the scientific study of language (Deutschmann et al., 2020; Besong& Robert, 2019; Robert, 2018; Dibie& Robert, 2014; Monday &Eze, 2012; Nwala, 2008; Emeka-Nwobia, 2007). It is said that the various definitions of linguistics given by different persons all point to the common viewpoint that linguistics is that field which studies language scientifically, analysing different levels of language (Robert, 2018; Nwala, 2008). Linguistics is a science, even though its scientific status is contested. For some persons, it is not a science; for another set of persons, linguistics is a social science, but not a pure science; for others, linguistics is both a pure science and an art. For this study, linguistics is an interdisciplinary and a multidisciplinary field of science, which its corpus is a phenomenon rather human being.

The fact that humans use language does not rule out the reality of its phenomenal status. Being a science, linguistics, IT and biology correlate in terms of scientific status and engagements. Being a phenomenon, just like any phenomena in the pure sciences, language makes linguistics a science. That is additional to linguists following scientific procedures in studying the phenomenon of language either alone or in combination with other phenomena of existence and in relation to humans and the non-humans of the ecosystem. Linguistics studies the phenomenon of language. Again, as a science, linguistics is known with the scientific methods of data collection, observation, test, experimentation, hypothesis, generation or formulation of linguistic principles or laws (theories), and valid results (facts)

(Besong& Robert, 2019; Dibie& Robert, 2014 & 2016; Nwala, 2008; Emeka-Nwobia, 2007; Anagbogu et al., 2001; Agbedo, 2000; Ndimele, 1997).

Linguistics is the field that undertakes all that concerns language, including informatics, language engineering and speech pathology. Linguistics also engages in practical and laboratory activities, speech and language disorders, language/speech therapy, clinical services in the field of clinical linguistics, computing and communication, forensic science, etc. (Robert, 2018; Nwala, 2008). Some of these sub-disciplines are also shared by or found in biology and information technology. Among them are informatics, clinical linguistics, forensic science, speech defects and pathology, laboratory activities, communication science, etc. In what justifies the foregoing, Sin categoría (2018) notes, "Many of the questions linguists pose overlap with fields in the life sciences, social sciences, and humanities, thus making linguistics a multidisciplinary field" (p. 3). It is quite obvious that multidisciplinary nature of linguistics is affirmed in the literature. As Sin categoría (2018) adds, "as a multidisciplinary field, Linguistics, attempts to understand how language is stored in the human mind/brain and how it is part of everyday human behavior through its sister fields of neuroscience, philosophy, psychology, anthropology, sociology, and computer science" (p. 3). The mention of computer science justifies the linking of IT and philosophy to linguistics vice versa by the current study.

In what sheds light on the foregoing, Ekpenyong and Ikegbu (2018) emphasize the need to integrate linguistics into other disciplines viz: "Languages, linguistics and communications must be added to the list of the allied challenges of humanity, where there is a high increase in knowledge upon which philosophical thought is increasingly needed to deal with them" (p. 297). Their words call interdisciplinary collaboration. That is to say IT professionals, biologists, other scientists and professionals of non-scientific fields alike need to collaborate with linguists. The linguist is the scientist concerned with the phenomenon of language in its entirety. As Dibie and Robert (2014 & 2016) and Besong and Robert (2019) observe, the placement of linguistics in the Faculties of Arts and Humanities, Education and Social Science does not negate its scientific status. This is because linguistics, like other fields in the pure, natural, applied, social, and management sciences, usually employs scientific methods in studying language, its subject matter. The diagram below shows the place of linguistics in sciences, which IT and biology:




**Source: Sin categoría (2018)**

**Theoretical Framework**

This study is anchored on Michael A.K. Halliday's (1978; 1985; 1994) Theory of Systemic Functional Linguistics (TSFL) and the Theory of Structural Functionalism (TSF). Accordingly, Halliday theorises that language is a social semiotic that offers its users a network of choices to create both spoken and written texts (Halliday, 1985; 1994). Teo (2000) rightly observes that the meaning of spoken or written texts (messages) is dependent on the choices made by users, especially speakers and writers. It follows that TSFL considers language as a resource for a meaningful industrial dialogue between two parties or among many parties. This study avers that written and spoken meanings about subjects and objects of IT, biology and Linguistics are language resources made and used variously by individuals in the fields. From the fields, they get to other spheres of society.

Halliday is of the opinion that language is only functional when used appropriately to carry out a whole lot of beneficial or positive activities. The activities include those of information technology, biology and linguistics. In the words of Halliday (1985, p. 1), "It seemed to me that explanations of linguistic phenomena needed to be sought in relationships among systems rather than among structures – in what I once called 'deep paradigms' – since these were essentially where speakers made their choices." The systems, this study argues, include IT and biology that relate existentially and functionally. It should be noted that IT, biology and linguistics are all phenomena having functional relationships among them. They are systemic, intellectual, practising and societal structures. From Halliday's words above, it should be noted that systemic functionality in linguistics has an operational correlation with IT and biology.

Analogically, various concepts in biology and information technology are linguistic concepts. Linguistics situates in both IT and biology. Without linguistics, concepts in IT and biology would not be created. Terminologies of both biology and IT are linguistic concepts given phenomenal dimensions in practical contexts. Right from their morphological creation to their pragmatic usage and realities, there is an existential functional connectivity between and among them (Betza, et al. 2022; Bhatia, 2021). Essentially, there is an existential functional connectivity among linguistics and these other two fields, IT and biology. That calls to mind the theory of structural functionalism, a sociological theory that considers elements of society as being functional and interconnected, thereby co-existing, correlating, and acting or functioning interdependently in their dealings (Merton, 1938; Chinoy, 1967; Ashley, 2019). We will turn to TSF soon afterwards. Both biology and information technology rely on language for functionality. Language is what makes them operational and functional.

Language is the corpus of linguistics. It connects all human endeavours. Knowledge of and information about IT, biology, and other fields are made known through language. Linguistics is the ultimate among the three fields under exploration herein because it is the field that concerns itself entirely with language, the medium for communicating knowledge and activities of IT and biology (Robert et al., 2016; Temur, 2020). Meta-functions are notion and practice that characterise TSFL. Meta-functions are field, tenor and mode. Accordingly, tenor refers to the socially defined relations between/among the parties involved in an interaction (Halliday, 1978, 1985 & 1994). Field refers to the subject matter of the text. Mode is the medium and role of language in the situation (David, 2002; Halliday, 1994). It follows that language use involves two or more parties in communication. These parties initiate, use and end up communication process. Next, there must be a subject matter in every discursive interaction of the parties engaged in communication (Halliday, 1985 & 1994; Teo, 2000; David, 2002). In addition, language must be used for communication.

That is to say there can be no communication without language (Teo, 2000; Austin, 1962). Also, it implies that there is a functional connectivity between linguistics and other fields of human endeavours, such as biology and information technology. Having stated the above, we now turn to the Theory of Structural Functionalism (TSF), also known simply as Functionalist Theory (FT). STF is founded by Emile Durkheim and Robert Merton. These are the earliest pioneers of the functionalist theory, who were sociologist. Functionalism, according to Brown (1952), is a condition in which all parts of the social systems work together in a sufficient degree of harmony or internal consistency, devoid of persistent conflicts that can neither be resolved or regulated. To Cancian (1960), functionalism is a system that can be analysed into a set of interdependent parts, the value of some of which determine whether or not a certain property will occur in the system, and there are certain limits on the variations of the values of the variables and the system would thereby disappear. These two definitions, which are taken to suffice for others, highlight the overall notion of functionalism.

The most important message drawn from the definitions is that systems correlate and function interdependently with one another. Thus, it supports the standpoint of this study that IT, biology and linguistics correlate existentially and socially function interdependently. For the functionalists, elements of society are functional and interconnected. Basically, functionalist theorists hold that society is a collection of integral parts of a whole, which must co-exist, correlate, and be interdependent and functional in their dealings, so as to pursue and realize substantial established goals that are of the good of all (Merton, 1938; Chinoy, 1967; Ashley, 2019). For the functionalists, the functionality and the stability of society depend on the collective contributions of all its constituent elements (Ashley, 2019, pp. 1-2).

Elements of society are functional if they contribute to social stability and dysfunctional if they disrupt social stability. Some aspects of society can be both functional and dysfunctional. There are manifest and latent functions. Manifest functions are consequences that are intended and commonly recognised; while latent functions are consequences that are unintended and often hidden (Ashley, 2019). Structural functionalism aptly explains the inter-connectivity among IT, biology and linguistics. Undoubtedly, there is a systemic, structural and functional correlation among them. The connectivity is such that when one fails to function, the others in the chain or hierarchy get affected and thereby fail function (well) too.

The constituents of the chain of structural functionality are more like the parts of the body. If one part is disfigured, the other parts are also affected in terms of wellness (Ashley, 2019), despite still functioning without the disfigured one(s). Therefore, for maximal functional society, these three human endeavours (fields) correlate with one another. They are interdependent and rely on one another in different regards. Given the foregoing, it is quite evident that IT, biology and linguistics correlate. As learned from TSFL and TSF, it is also justifiable to link IT, biology and linguistics theoretically and practically.

**How Information Technology, Biology and Linguistics Correlate**

In this section, attempts are made to explain and demonstrate how the three fields correlate. Accordingly, information technology (IT), biology and linguistics correlate on the basis of language, science and information. That is, language, science and information are the core phenomena that correlate the three fields. While there are other factors, this paper focuses on these three phenomena, as the base of the correlation among IT, biology and linguistics. Language lies behind the fields. Without it, there can be nothing meaningful about them as

well as all other spheres of life (Uche, 1994). Linguistics, not biology, information technology, physics, chemistry, or any other field of the natural sciences, can sufficiently explain mind and language. For example, they cannot explain, describe or predict the structure and meaning of a passive sentence (Robert et al., 2016; Temur, 2020). Linguistics alone can do so among them (the aforementioned and many other natural sciences). This reality tells us why linguistics is the base of the correlation between IT and biology. Thus, linguistics situates in both IT and biology.

Again, it is difficult to understand simple affirmative transitive sentences in strictly neurological terms. If passive sentences, phonemes, morphemes or constraints on constituent movement are not physical, chemical or biological objects, then they are either irrelevant or belong to the realm of other non-natural (purely descriptive) sciences. It is affirmed that many biologists, physicists, chemists and linguists believe that Chomsky's methodological naturalism implies that if any theory of language structure is empirically adequate, then that theory is already part of the body of scientific, naturalistic research on language (Sin categoría, 2018; Călinescu, 2012). This stance makes sense if we recognise that we cannot prejudge what kind of physical reality language will have, and if we limit ourselves to studying it like just another natural object. This means that the discipline linguistics is a natural science, although it does not work with bosons, isotopes or proteins.

As such, biolinguistics is a branch of this 'natural linguistics'. In contrast, the thought that biolinguistics is part of natural science is repeatedly rejected by some biologists, physicists, linguists and philosophers. The commonest reason for the rejection is the fact that those who reject this notion do not conceive language as a natural phenomenon. The present study considers language as a natural phenomenon. For Rantala et al. (2018), science is the field that ultimately binds these three disciplines: IT, biology and linguistics. Science, which derived from the Latin 'scientia'– meaning 'knowledge', can be defined as knowledge, a very specific way of learning or knowing about the natural world. This etymology of science should ordinarily put to rest the debate on whether or not linguistics is a science. The reason is that apart from its application of the commonly known universal scientific methods of enquiry, the field of linguistics entails knowledge, and specific epistemic ways of learning and teaching language, and the natural world. It is a common fact that science largely accounts for the technological revolutions that characterize the contemporary era.

Yet, the inability to apply scientific methods to certain aspects or areas of knowledge and human experience does not negate their application to language and linguistics. The areas of the inapplicability include answering purely moral or spiritual questions, ethical questions, and aesthetic questions. Science cannot investigate these areas because they are outside the realm of material phenomena, the phenomena of matter and energy, and cannot be observed and measured. Interestingly, linguistic corpus can be measured. Language, its thrust, alongside the associated systems can be observed, tested, hypothesized, measured and results, principles and conclusion generated on them. Again, there are two main approaches to science. These are the empiricist and the rationalist approaches or conceptions. According to the empiricist view, the goal of science is to discover the causes and nature of things. This goal is pursued in linguistics about language.

On the other hand, the rationalists are of the view that the aim of science is to translate nature into the language of mathematics. The importance of language in all human endeavors is echoed in this view. That is what the idea of 'language of mathematics' reflects or highlights. Thus, is quite justifiable to think and argue that IT, linguistics and biology correlate and

function interdependently. Sin categoría (2018) indicates, it is commonly believed that the task of science is not to find concepts or representations of the entities that compose reality, but to construct mental realities (concepts and theories) and try to determine through experiments which ones find support in what we perceive. Given the belief, the correlation of IT, linguistics and biology rests on their scientific nature, engagements, subjects and objects, methods or approaches, characteristics, and functional interdependence. The correlation is both overt and covert. It is significant and quite indisputable. This study avers that the correlation is quite indisputable because its thesis on the correlation among the fields has been substantiated evidently.

Both general linguistics and biolinguistics do same, or they are not different in their consideration of how to construct formal models and theories that make the object of inquiry intelligible (Sin categoría, 2018). Again, IT, biology and linguistics are characterized by observation, tests, experiments, hypotheses, and formulation of principles and laws. Linguistics and biology are of pure science (Dibie& Robert, 2014; Nwala, 2008; Agbedo, 2000). By implication, these three fields are scientific. They are both foundational science disciplines. At onset (in ancient times), linguistics was philology (Nwala, 2008; Agbedo, 2000). It evolved in the same era with biology. IT is of both applied and pure sciences. Information science is of natural or pure science. Technology is of applied and natural sciences.

It is observed that the extent to which science can go in all it does and can do depends largely on language (Dibie& Robert, 2014; Uche, 1994). Here, this paper argues that the extent to which biology and IT can go depends on language, the corpus of linguistics. The place of language in all endeavors, including sciences, has been echoed by Uche (1994) viz: “Without language, science cannot strive; this shows that effective communication in science involves [the] ability to use and understand the technical terms as well as interpret information encoded in symbolic form into another non-symbolic form of language” (p. 101). Thus, for science to strive or even get its dealings carried out and revealed to society, it must fall back to linguistics.

The two correlate and function interdependently in the course of doing so. Teaching biology involves providing information about the latest developments in the field of biological sciences all over the world. The teaching is only possible or meaningful with the use of language. Information correlates with information technology, biology and linguistics. The three fields, like any other fields, involve, need and rely on information. On the other hand, IT and biology fall back to linguistics for language, which they need and use inevitably.With the innovation in the information sector in contemporary time, information technology is the base of information, which is needed and used in all fields. It is with technology that information about biology, linguistics, communication, science, etc. is spread, taught, learnt, transmitted and sustained across generations.

Furthermore, the fields correlate by virtue of their subject matters. These are language, life and information, which are all phenomenal, natural, biological, practical (empirical) and conceptual (Okafor, 2010). Language is to linguistics. Life is to biology. And, information is to information technology. Additional to information is technology in the field of IT. Basically, linguistics takes the lead in all that concerns the language-based constructions of everything about IT and biology. The other two cannot undertake such constructs about linguistics. However, they influence constructed linguistic properties in their respective field to be inherent and identical to each of them. This assertion is evident as in the case of biology

registers or jargons, IT registers or jargons, and new media language with its registers, jargons and other evolving associate linguistic features (Temur, 2020; Robert et al., 2016).

## Conclusion

On the whole, this study has analyzed and evidently established the correlation of IT with biology and linguistics. It has described and shown how the three fields correlate. Following its exposition and analysis, it is realized that the peak of the correlation is evident in their connective functionality that has existential or natural bearing. The correlation is of scientific, epistemic, social, interdisciplinary, and professional relevance to both developed and developing societies of the globe. The analysis particularly demonstrates that linguistics leads the two other fields in the interplay. No doubt, these are three essential fields of national concern to every nation of the world, not excluding the USA.

Thus, the novelty of the study rests majorly on its exploration of the correlation among the three fields, which is a neglected theme in extant literature. It rouses deserving attention to this erstwhile laid-bare knowledge, bridging the gap and drawing scholastic attention to it. Quantitative research and further qualitative studies on the explored theme are needed for betterment. Professionals in the fields are charged to build a sustainable interdisciplinary culture. They should make concerted efforts to work on and create high level of awareness about *interdisciplinarity*, professional correlation and the imperative of meaningful collaboration, as evident in the case of information technology (IT), biology and linguistics.

## References

Agbedo, C. U. (2000). *General linguistics: An introductory reader*. ACE Resources Konsult.

Aktaruzzaman, M., Shamim, M. R. H., & Clement, C. K. (2011). Trends and issues to integrate ICT in teaching and learning for the future world of education. *International Journal of Engineering and Technology*, 11(3), 114-199. Retrieved from: http://ijens.org/Vol%2011%20I%2003/118603-0202%20IJET-IJENS.pdf.

Alić, S. (2010). Philosophy of media: Is the message. *Synthesis Philosophica*, 50 (2), 201–210. UDC 1:316.774.

Anagbogu, P. N., Mbah, M. B., &Eme, C. A. (2001). *Introduction to linguistics*. J.F.C. Ltd.

Anjugu, J. N. (2013), Impact of social media on student's academic performance (a study of students of University of Abuja). Unpublished research project submitted to the Department of Mass Communication, Faculty of Management and Social Sciences, Caritas University, Amorji – Nike, Enugu, Nigeria.

Ashley, C. (2019). Understanding functionalist theory: One of the major theoretical perspectives in sociology. https://www.thoughtco.com/functionalist-perspective-3026625.

Asouzu, I.I. (2017). Changes, adaptation and complementary noetic transformation. Keynote Address delivered at the 2nd African Philosophy World Conference (UNICAL 2017): Jointly Hosted by the University of Calabar, NnamdiAzikiwe University, Awka, and the University of the Witwatersrand in Collaboration with the Conversational School of Philosophy (CPS), held at the Senate Chamber, University of Calabar: October 12–14.

Austin, J. L. (1962). *How to do things with words*. Oxford University Press.

Besong, E. N., & Robert, O. S. (2019). Socialisation agents' task in early career guidance/counselling and rousing students' interest to Arts/Humanities. *International Journal of Art and Literature*, 3 (1), 1-8.

Betza, M. et al. (2022). Service delivery for complex rehabilitation technology: A scoping review. *Disability and Rehabilitation: Assistive Technology*, vol.17, no.8, 853–871. https://doi.org/10.1080/17483107.2022.2111609

Bhatia, R. (2021). Emerging health technologies and how they can transform healthcare delivery. *Journal of Health Management,* 23(1), 63–73. DOI: 10.1177/0972063421995025

Boateng, R. O., &Amankwaa, A. (2016). The impact of social media on student academic life in higher education. *Global Journal of Human-Social Science: G Linguistics & Education, Volume 16, Issue 4, Version 1.0*.

Bonsu, K. A., Duodu A., Ansere, J. A., &Djang-Fordjour, K. T. (2013, November). The challenges and prospects of ICTs in teaching and learning in Sunyani Polytechnic, Ghana**.** *CAPA Scientific Journal*, 1 (1).

Brown, R. A. (1952). *Structure and function in primitive society: Essays and addresses*. Longman.

Călinescu, M. (2012, January 1). Chomsky's biolinguistic approach to mind and language. *Linguistic & Philosophical Investigations*, 11, 91-96.

Cancian, F. (1960). Functional analysis of changes. *American Sociological Review*, 25 (6).

Chinoy, E. (1967). *Society: An introduction to sociology*. Random House.

Chomsky, N. (2000). *New horizons in the study of language and mind*. Cambridge University Press.

Chomsky, N. (2002). On nature and language. In A. Belletti, & L. Rizzi (eds.), Cambridge University Press. https://doi.org/10.1017/CBO9780511613876

Coleman, L. O., Gibson, P., Cotten, S. R., Howell-Moroney, M., & Stringer, K. (2016). Integrating computing across the curriculum: The impact of internal barriers and training intensity on computer integration in the elementary school classroom. *Journal of Educational Computing Research,* 54(2), 275-294. doi: 10.1177/0735633115616645.

Crain, S., Koring, L., & Thornton, R. (2017, Oct. 1). Language acquisition from a biolinguistic perspective. *Neuroscience & Biobehavioral Reviews: The Biology of Language*, 81 (Pt B), 120-149. doi:10.1016/j.neubiorev.2016.09.004.

David, B. (2002). *Systemic functional linguistics as a model for text analysis.* ASp [Enligne], 35-36.mis enligne le 05 août 2010, consulté le 05 décembre 2012. URL: http://asp.revues.org/1584; DOI: 10.4000/asp.1584

Davis, S. P. (1987). Bibliographic control of special collections: Issue and trends. *Library Trends.*

Deutschmann, M., Steinvall, A., &Lindvall-Östling, M. (2020). Raising awareness about gender and language among teacher-training students: A cross-cultural approach. *The Journal Open Linguistics*, https://doi.org/10.1515/opli-2020-0181.

Di Sciullo, A. M. et al. (2010, Winter). The biological nature of human language. *Biolinguistics*, 4. S2CID 141815607

Di Sciullo, A. M., &Boeckx, C. (2011). *The biolinguistic enterprise: New perspectives on the evolution and nature of the human language faculty volume 1 of Oxford studies in biolinguistics.* Oxford University Press. ISBN 9780199553273.

Dibie, G. A., & Robert, O. S. (2014, Sept.). Appraising the significance of arts and languages in polytechnic education. Paper presented at the *5th National Conference of the Nasarawa State Polytechnic ASUP Chapter,* held at the Nasarawa State Polytechnic, Lafia: 9th-11th.

Dibie, G. A., & Robert, O. S. (2016). Significance of arts and languages in polytechnic education. *IIARD InternationalJournal of Education Research (IJER).*

Edogor, I. O. (2012). Social media use among students of selected universities in South-Eastern Nigeria. Unpublished Master of Arts Project of Mass Communication, University of Nigeria, Nsukka.

Ekpenyong, B., &Ikegbu, E. A. (2018). The language of philosophy and the philosophy of language: A symbiotic paradigm. *Budapest International Research and Critics Institute- Journal (BIRCI-Journal)*, 1 (3), 296-305.

Emeka-Nwobia, N. (2007). *Sociolinguistics: An introductory reader*. Larry Caleb-Copy Craft International Ltd.

Eze, P. I., &Ogbaga, E. (2019). Influence of social media on academic activities of educational technology students in higher institutions. *World Applied Sciences Journal*, 37(9), 792-797. doi: 10.5829/idosi.wasj.2019.792.797.

Halliday, M. A. K. (1978). *Language as social semiotic*. Edward Arnold.

Halliday, M. A. K. (1985). *An introduction to functional grammar*. Edward Arnold.

Halliday, M. A. K. (1994). *An introduction to functional grammar (2nd ed.)*. Edward Arnold.

Haruna, I., &Oyelekan, G. O. (2010). Provision and utilization of information resources and services in Nigerian defence academy (NDA) library, Kaduna. *Journal of Information Technologist*, 7(1). Doi:10.4314/ict.v7i1.60426

Jenkins, J. (1997). Biolinguistics– structure, development and evolution of language. *Journal of Formal, Computational and Cognitive Linguistics*. CiteSeerX 10.1.1.35.1374.

Keengwe, S., Onchwari, G., & Wachira, P. (2008). The use of computer tools to support meaningful learning. *AACE Journal*, 16(1), 77-92.

Kuppuswamy, S., & Narayan, P. (2010). The impact of social networking websites on the education of youth. *International Journal of Virtual Communities and Social Networking (IJVCSN)*, 2(1), 67-79.

Lenneberg, E. H. (1967). *Biological foundations of language*. Wiley.

Lievrouw, L. & Livingstone, S. (2002). *The handbook of new media*. Sage.

Luhamya, A., Bakkabulindi, F. E. K., &Muyinda, P. B. (2017). Integration of ICT in teaching and learning: A review of theories. *Makerere Journal of Higher Education*, 9(1), 2–36. dx.doi.org/10.4314/majohe.v9i1.2.

Mansell, R. (2004). ICTs for development: What prospects and problems? *The Southern African Journal of Information and Communication*, (5), 1-22.

Martins, P. T., & Boeckx, C. (2016, August 27). What we talk about when we talk about biolinguistics. *Linguistics Vanguard*, 2 (1). doi:10.1515/lingvan-2016-0007. S2CID 131936047.

McLuhan, M. (1964). *Understanding media*. Routledge & Kegan Paul.

Merton, R. K. (1938). Social structure and anomie. *American Sociological Review*,.3(5), 672-82.

Moheb, L. (2021, December). Theoretical models of integration of interactive learning technologies into teaching: A systematic literature review. *International Journal of Learning, Teaching and Educational Research*, 20(12), 232-254. https://doi.org/10.26803/ijlter.20.12.14

Mondal, P. (2019). *Language, biology, and cognition: A critical perspective*, [1]. Springer Nature.

Monday, H. G., &Eze, C. C. (2012). *Basic studies in English and communication skill for tertiary institutions*. Shola Publishers.

Ndimele, O. (1997). *Semantics and the frontiers of communications.*Uniport Publishing Press.

Ndimele, O. M. (1999). *A first Course in morphology.*Emhai Press.

Nwala, M. A. (2008). *Introduction to linguistics: A first course (rev. ed.)*Osi and Alozie Ltd.

Nwode, G. C. (2022). Impact of new media on students' performance in written composition in selected tertiary institutions in Ebonyi State, Nigeria. PhD thesis, Department of Languages and Linguistics, Post-Graduate School, Ebonyi State University, Abakaliki.

Nwode, G. C., Osuchukwu, C. N., &Ogayi, M. C. (2019, December). Youth language, social media identity, and their implication to the cultural norms of youth speakers of the Igbo language. *IOSR Journal of Humanities and Social Science (IOSR-JHSS*), 24(12), ser. 3, 84-89. DOI: 10.9790/0837-2412038489 www.iosrjournals.org.

Okafor, S. O. (2010). Application of information and communication technology (ICT) in teaching and learning of Igbo language in Nigerian schools. *Multidisciplinary Journal of Research Development,* vol.15, no.2.

Onuh, C. N. (2022). Impact of social media technology in the development of Igbo language among university students: A study of Imo State University Students. *British Journal of English Linguistics*, 10 (3), 12-29.

Osuchukwu, C. N. (2012). Acquisition of literacy skills and the concept of indigenous knowledge. K*nowledge Builders*: *A Multidisciplinary Journal for Advancement of Scholarship*, 130-138.

Rantala, T. et al. (2018). The effect of sustainability in the adoption of technological, service, and business model innovations. *Journal of Cleaner Production,* 172, 46–55.

Ravi, B. K. (2012). New media, culture and society. *Academic Research International*, 2 (2).

Robert, O. S. (2018). Formation, types and processes of questions in Bekwarra language of Northern Cross River. *International Journal of Language, Literature and Culture,* 5 (3), 27-34.

Robert, O. S., Abubakar, Z. A., &Besong, E. N. (2016). Library, information technology, oral literature and history education and sustenance in contemporary Nigeria. *Sub-Sahara Scholar International Journal of Contemporary Education Research– JCER-2016-057.*

Sin categoría, J. M. (2018, Dec. 11). What kind of linguistics is biolinguistics?; a slightly edited version of What are languages? A Biolinguistic perspective. *Open Linguistics*, 1, 71-95.

Ta, J. Q. **(**2014).What impact has social media truly had on society? A post on Twitter, Facebook, Google+Flipboard 23,13 August.

Temur, T. (2020). Integration of ICT culture as important element of teaching of foreign language. *European Journal of Research and Reflection in Educational Sciences,* 8 (12), *part II*. www.idpublications.org.

Temur, T. (2020). Integration of ICT culture as important element of teaching of foreign language. *European Journal of Research and Reflection in Educational Sciences,* 8 (12), part II. www.idpublications.org.

Teo, P. (2000). Racism in the news: A critical discourse analysis of news reporting in two Australian newspapers. *Discourse and Society 11* (1), 7-48.

Uche, B. G. (1994). The interaction between science and language. *The Nigeria Teacher Today: A Journal of Teacher Education, Kaduna,* NCE 3(1), 101.

Wu, J. (2014, January 15). An overview of researches on biolinguistics. *Canadian Social Science*, 171–176. CiteSeerX 10.1.1.820.7700.

Zwangobani, E. (1987). Communication for development: A developing country perspective. Conference Proceedings of Africom 87, Computer Society of Zimbabwe, Harare.