# UDUDO REASONING IN AFRICAN THOUGHT: A POSTMODERN FORMALIST METHOD FOR LOGIC

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**Abstract**
The dominance of methods of mathematical reasoning such as the axiomatic method in modern logic has taken a toll on the independent development of logic as a separate discipline. However, the emergence of other non-standard systems of logic which could be described as postmodernist shows how a radical break might be necessary in salvaging logic from the grip of mathematics. Our goal in this essay would be to propose and articulate a post modern formalist method called Ududo Reasoning for logic.
**Keywords:** Postmodernism, Logic, Ududo, Reasoning, Method, Formalist

## Introduction

When every individual thinks in a different way or groups and individuals fail to understand the thinking of other groups or individuals, then there is a big problem. Logic is the algorithm of thought and post modernism is a bold and recalcitrant demonstration that every group if not every individual has his own model. Underlying the relationships between men or groups is the principle of intelligibility that makes for understanding of one another's words, communications, gesticulations, mannerisms, signals, etc. This principle of intelligibility is nothing but logic. That individuals or groups understand themselves is because they belong to the same logic community or that each side fairly understands the logic of the other side. Where this is not the case, there are bound to be disagreement, misunderstanding, misreading, misinterpretation, rancor, crises, trouble, enmity and bitterness. Let us not preclude the regular possibility of individuals or groups pretending not to understand a logic they actually understand and thereby causing some of these dangerous situations listed above just for some selfish reasons. In such cases, it is always easy to know that there are no genuine cases for misunderstanding or not understanding at all the logic of communication. And to such individuals or groups, we always reprimand for their treachery and mischief.

Postmodernism seeks to radicalized everything (OZUMBA & CHIMAKONAM 2012, 94) with reductions that cut across group-based relativism to extreme cases of individual relativism. Cases can be made for individual-based reductions as we see in post modern attitudes to moral

standards, but in logic, for once, the limitation of postmodernism is made bare. We simply cannot talk of individual logics or thought models not because we disapprove of such but because it is not possible. If it is possible at all, it cannot be known therefore, it is not possible! To account for the existence of a principle of intelligibility there must be at least a relationship or communication between two parties, with recourse to one entity alone, anything trumped up cannot be said to be logical. So, it is simply impossible to have individual thought models. At the extreme, it is only group-based logics or thought models that are possible. In this constitutes the wedge of limitation which postmodernism cannot cross.

In this essay, we want to look at what logic and postmodernism are in their own right as disciplines. Then, we shall take a brief look at logic and postmodern thinking identifying some postmodern logical systems. We shall attempt to propose a formalist method that could be described as postmodern in a bid to develop and promote a non-axiomatic method for logic. This represents a radical break from the popular tradition in which modern logic, also known as mathematical logic has effectively become a branch of mathematics. An attempt to establish the independence of logic from mathematics could not be any less postmodern. It may interest the reader to know that the backbone of postmodernism is broken only by logic because postmodernism itself is a type of logic.

**Logic and Postmodernism: Conceptual Clarification**
Logic read simply, constitutes principles of intelligibility. It enables us to distinguish correct reasoning from an incorrect one. The bases of this correctness are the laws of thought and other logical principles and rules that derive their force from them. A reasoning/proof is therefore correct if it abides by the provisions of these laws and it is incorrect if it breaks any of them. Correctness and incorrectness as we employ them here could be treated as synonyms for intelligibility and unintelligibility. Here, a correct reasoning could be described as intelligible whereas an incorrect one could be described as unintelligible. Between two interlocutors, A and B, there are four possible intelligibility positions that must hold namely:

(i)  A and B understand themselves in the form of anti-symmetry relation i.e.

$Rxy \wedge Ryx \supset x = y$. Here, that the conversations from A and B to each other are intelligible to each is due to the fact that they employ the same logic which they both understand its rules.

That one of A and B pretends that the conversations from the other is not intelligible to him, whereas in actuality it is, i.e. they both employ the same logic and do understand its rules. This relation is asymmetric i.e.

Rxy ⊃ ~Ryx. This relation is forced because one party pretends not to understand the other. This sort of thing happens every day in situations where one person wants to score undue advantage over another.

(iii) That one of  A and B genuinely does not understand the rules of the logic employed  by another. This relation is non-symmetric i.e. (~Rxy ⊃ Ryx) ∨ ~Rxy. This occurs any time people from two different cultures work together.

(iv) That A and B understand themselves in the form of symmetric relation i.e. Rxy ⊃ Ryx. Here, one is able to understand the other though they each employ different logics but each is versed in the principles and rules of the other's logic. This usually occurs between two people from different cultures but who are versed in each other's culture. For example, a Chinese who spent years doing his university studies in America and an American who spent years doing cultural research in China. Although, they may each employ logical nuances from their traditions in their conversations, it is possible for each to understand the other.  What I have done in the preceding is simply to show that logic is the principle of intelligibility. The motor through which individuals in a given culture understand themselves and members from different cultures understand themselves. Language[1] is properly a motor or medium of communication of thoughts that occurs before understanding. However, implicit in all means of communication in any culture is logic which makes such intelligible. Just as the Indian and the Igbo may speak English which has its logic as their common bond of intelligibility; they each have their separate indigenous languages with their background logics.

While postmodernism can be defined as an anti theoretic theory which objects to the existence of an absolute standard yet, it is in itself an absolute standard.  Thus it is a thorough-going self referential theory, whose rejection of every theory is a rejection of itself.

Postmodernism is an *en fanterrible* that emerged in the late 20th century. For the most part, it is a thorn in the flesh of modern theorists.  All metadiscourses are dismissed as false testimonies and a difficult position is advocated.  In one word, postmodernism has radicalized thought, offered license

[1]. I am not unaware that spoken language is not the only medium of communication but communication through whichever medium precedes understanding.

of tenability to every opinion and thus ostracized standard.  Paul Crowther notes that "every age has its special verity.  In the case of 'post modernity' this takes the form of an emphatic relativism (in all spheres of knowledge and value) which posits itself as a radical break with the foundationalist and utopian traditions of the modern intellectual world" (1).  What this means is that postmodernism simply radicalized relativism and individualism and then applied them to all spheres of knowledge – even science.  In a post-modern world, truth and reality are individually shaped by personal history, social class, gender, culture and religion.  These factors, according to postmodern thinking, combine to shape the narratives and meanings of our lives as culturally embedded, localized social constructions without any universal application.

As a term, Gary Aylesworth writes that 'post modernism' first entered the philosophical lexicon in 1979, with the publication of the [Postmodern Condition …] by Jean-François Lyotard.  In this book, Lyotard defines postmodernism thus: simplifying to the extreme, I define postmodern as incredulity toward metanarratives.  This incredulity is undoubtedly a product of progress in the sciences: but that progress in turn presupposes it.  To the obsolescence of the metanarrative apparatus of legitimating corresponds, most notably, the crisis of metaphysical philosophy and of the university institution which in the past relied on it.  The narrative function is losing its functions, its great hero, its great dangers, its great voyages, its great goal (xxiv).

What Lyotard means here is that postmodernism emerged as an opposition to the absolutist standards of modernism, the implication of which is the erosion of vital tools of development among intellectual and non-intellectual cultures.  There is a delicate note here which Lyotard pronounced later.  It is the position that the postmodern also presuppose the modern.  Lyotard (79) declares that the postmodern is undoubtedly a part of the modern. "A work can become modern only if it is first postmodern. Postmodernism thus understood is not modernism at its end but in the nascent state, and this state is constant" (79).

On the whole, following from the conception of postmodernism above, we may regard the Ududo formalist method we propose in this essay as a postmodern reactionary to the orthodox axiomatic method. Also, the Ezumezu logical system just like the other non-standard logics we shall discuss are forms of postmodern thinking focusing on alternatives and disestablishing any absolute standard for thought.

## Post Modern Logics

Logic describes correct reasoning as well as sensible propositions. What is meant here is that logic not only distinguishes correct reasoning from incorrect reasoning, it also distinguishes sensible proposition from nonsensical ones. In this wise we talk of the form of logic and its subject matter. The formalization of

logic since the 19th century, as laudable as it is, has also impoverished its philosophical content (MACFARLANE 2002). Logicians now work with strings of symbols aimed principally to achieving mathematical precision. But to the extent, they have advanced hopes in this direction; logic has to the same extent suffered in terms of content. Even when symbols are created for the semantic content, they are almost, always employed without recourse to any propositions they purportedly evaluate. Thus, the race to increase the so-called expressive power of logic has led to a post-modern radicalization of the instrument of logic. First, it has become too mathematical and less philosophical; second, many and different types of logics like fuzzy, paraconsistent, dialectic, many and multi-valued logics, etc, have emerged to distemper and disquiet logic as a consistent instrument of research.

These variant logics could be post-modernist where post modern logic itself could be formless and with infinite value range. So we can talk of some types of logics like the ones mentioned above as post modernist in structure and we can also talk of another type that we can call post modern logic. This latter type is formless and infinite in values. It is what undergirds the postmodern mantra of radical relativization which Paul Feyerabend eulogized with the phrase "Anything goes" (28). When deployed in any area it quickly radicalizes it by upsetting the inherent standard, norms and laws and heralds the introduction of anarchy. For want of a better expression, the business of science, its methods and direction when brought under the influence of this post modern logic have been described as epistemologically anarchistic (FEYERABEND  23 – 28). As Feyerabend notes:

> The idea that science can, and should, be run according to fixed and universal rules, is both unrealistic and pernicious. It is unrealistic, for it takes too simple a view of the talents of man and of the circumstances which encourage, or cause, their development. And it is pernicious, for the attempt to enforce the rules is bound to increase our professional qualifications at the expense of our humanity. (295)

What Feyerabend and other anarchists of the postmodern orientation promote is a world that runs on a postmodern logic of free, dynamic, relative and unrestricted modes of thought. It is these sorts of thought models that we here describe as postmodern logics.

**Paraconsistent logic:** This is a type of non-standard logic where the contradiction of a variable does not result in express affirmation of any other opposing variable. In that case, the process is not trivialized by a form of necessity that warrants the assertion of any variable. For this, the negation

elimination or the absurdity rule popularly called ex falso quadlibet in Latin does not hold in paraconsistent logic. This is the rule of such form:

P

~P

q

From the apparent contradiction of P and ~ P, the affirmation of any other variable seems necessary or inevitable. Paraconsistent logic makes this triviality to fail by its internal dynamics which permits contradictions to be true or contradictory variables of the form A ∧ ~ A to be both true. This is a postmodern form of reasoning in that it neglects the laws of thought. For that also, it is called a non-standard logic with reference to the laws of thought. One of the chief proponents of this logic is Graham Priest.

**Relevance logic:** This is also called relevant logic and it is a product of the Australia tradition where A. R. Anderson and N. Belnap (1975) S. Read (1988) etc., contributed much to its development. It simply insists that much more is required for validity of arguments of the form p ⊃ q where P is the antecedent of the conclusion q, p necessarily has to be relevant to q or that the negation of q be inconsistent with p (MAUTNER 480-81). The inspiration behind the workers of this logic is the need to guard against the paradoxes of material implication. Relevance logic is therefore a non-standard logic since it insists that the form of argument must imply its subject matter.

**Many-valued logic:** This is also called multi-valued. It is the more comprehensive of the non-standard logics because it comprises all logics of  the form of truth-value gap i.e. neither true nor false and truth-value glut i.e. both true and false. This means that all the logics with the value range of three to the infinitely numerable fall into this bracket. This also implies the degree theoretic semantic systems i.e. systems whose value range start from T complete truth to F complete false.

**Ezumezu logic:** This is another form of non-standard logic developed in the African tradition chiefly by J. O. Chimakonam. Its value range is three where propositions receive three designate values one complete and two incomplete values namely ½ representing (incomplete) truth 0/2 representing (incomplete) falsity and then in-between them 2/2 representing both true and false which is complete. This form of reasoning arises in African ontology where being is conceived to have two components, concrete and non-concrete, the absence of any component renders it incomplete. This logic also prevents *exfalso quadlibet* from holding.

**Fuzzy logic:** This is a non-standard logic that is sometimes referred to as Degree theoretic semantic because of its perchance for fragmenting value range in degrees. In it, propositions of a system are assigned values in real numbers like in Boolean Algebra. The two basic assignments are 1 and 0. Whereas 1 represents complete truth, 0 represents complete falsity. The next values assigned in fuzzy logic besides these two are in degrees which are not necessarily complete. These degree values are strictly greater than 0 and strictly less than 1 and are adjudged partially true. Some traditions sometimes interpret them as partially false. For example between 1 and 0, we can have ½, 1/3, 1/4, 1/5, 1/6, etc., and since it is not mathematically sensible to replicate subdivisions of 0 in this way, the value range are regarded as various degrees of truth hence partially true and not partially false.

**Postmodern logic:** It may surprise the reader that the systems discussed above are referred to as postmodern logics; why is there yet another called postmodern logic? What is the difference? They all have the same orientation in that they are non-standard logics with variants of truth range but the properly postmodern has an infinite value range above all else. So, one may also call it infinite-valued logic, or I-valued logic or I-logic as the case may be with the letter I representing infinity.

   I shall like to credit this logic to Paul Feyerabend who brought out the extreme radicalization of postmodern thinking. In his popular against method he advocates epistemological anarchism or anarchistic science (21). In his words, "All methodologies have their limitations and the only rule that survives is anything goes" (296). This implies infinity of values in any language fragmented in degrees of truth whose converse i.e. degrees of falsity is also admissible. In other words, in adopting the real numbers $\theta$ and N we shall have $\theta$ representing degrees of falsity and N representing degrees of infinite truth range. In this logic, there is no such thing as completely false or completely true. Every statement is partially true and of course, partially false. The difference however lies in the degrees of truth and falsity. The postmodern logic is described by contexts such that value range changes from point to point in simple infinity.

   One other thing about postmodern logic is that for every range of infinite values represented by the real numbers, there is no cardinality property attached. Put differently, no real number of partially false has a one-to-one correspondence with any real number of the range of partially true, hence simple infinity. For the great insight from Paul Feyerabend I shall like to christen the postmodern logic, Feyerebend logic. There are many other variants that could be described as postmodern logics besides the ones described above which for want of space, we could not discuss here. Some of such include dialethic logic, partial logic, four-valued logic, etc.

**Why a Formalist Method for Logic?**
The Igbo term Ududo simply means spider. Ududo reasoning as the name goes refers to the spider's web or web-like reasoning procedure. This becomes the type of reasoning mechanism we wish to project in this essay. It is postmodernist because it represents a break from modern logic in its designation of alternative proof apparatus. To reason may not be exactly the same thing as to prove as some logicians notably Gilbert Harman (107) insists, but proofs no matter how elementary involves a certain form of reasoning. One need to be able to move from premise to premise in the process of conducting a proof and in this is found reasoning of some type. Ududo reasoning as used here is additionally a kind of proof. Thus, it offers us a formalist proof apparatus to show whether a given argument is valid and sound or not without any axiomatic process—this also reflects the property of postmodern thinking. Logic therefore can be unaxiomatized. The one implication of modern development of western logic is that logic became lured into matrimony with mathematics such that whether mathematics can be given foundation in logic (Frege's logicism) or logic adopts the formal structure and axiomatic method of mathematics (Hilbert's formalism) remain permanently potential and tentatively actual in respective order. For this, modern western logic therefore becomes properly speaking, mathematical logic. A delusion is thus setting in because at the purest development of logic, there is a growing impossibility to talk of logic without mathematics or to simply say logic without the adjective mathematical. The basic reason for this delusion is the adoption of higher mathematical methods like axiomatization beginning in the 17th century with writers like George Boole, Charles Pierce, Gucippe Peano, Gottrifried Leibniz and then reaching perfection in Gottlob Frege, Bertrand Russell and Alfred-North Whitehead.

What we are out to achieve with Ududo reasoning is partly to return logic to logicians. In offering a non-axiomatized proof of arguments, even at the quantification level, Ududo reasoning procedure shows that there can be an unpolluted formalist method for logic in diagrammatic expressions of our reasoning. Note of course, that formalist method refers to a method of proof that is non-axiomatic i.e. structurally derived with nothing more than rules of thumb which serves as mere guide or explanatory tool to proof, whereas formal structure refers to the symbolic language in proof construction; the latter is a framework for both axiomatic and formalist methods of proof. We may therefore study mathematical logic as a branch of logic rather than the next inescapable stage in the development of our discipline.

It is imperative to clearly subsume mathematical logic to a bigger shadow of logic without mathematical method. Terms for example are defined functionally and function is characterized by method. In this way, modern logic which adopts mathematical method becomes subsumed under mathematics and is

hardly a discipline in its own right or at least a properdeutic or instrument to philosophy. Tongues have even begun to wag; Richard Kaye wrote a text book on logic recently and chose to title it *The Mathematics of Logic* (2007). According to him, mathematical logic has been in existence as a recognized branch of mathematics for over a hundred years. Its methods and theorems have shown their applicability not just to philosophical studies in the foundations of mathematics which is *perhaps their original raison d'être* but also to mainstream mathematics itself (vii). The stressed phrase signifies the original status of logic as a tool of philosophy but which has been transformed to mathematical logic as a branch of mathematics. Our point is that the adoption of mathematical method (axiomatic) in the business of logic for close to one hundred years now portrays it as a branch of mathematics.

The generally accepted theory is that the basic characteristic of logic is that logic should be about reasoning or deduction, and should attempt to provide rules for valid inferences. These rules which should be sufficiently and precisely defined become rules for manipulating strings of symbols. These strings of symbols should also have attached meanings since they are according to Leibniz in his *Calculus philosophicus or Ratiocinator, a Lingua Characterica* or what Frege in his [Begriffsschrift] calls a formula language for pure thought. In it, every well formed formula represents at least a sentence and every sentence Frege notes in his "The Thought: a Logical Inquiry" has a sense or meaning. The challenge here is that through the meanings of symbols, a logician should try to present a logical justification for the inference rules which ought to be demonstrations that express the hidden or intuitive structures of our reasoning. But contrary-wise, with the metamorphosis to mathematical logic, what the logician attempts to do in proofs of arguments is present a mathematical justification of the rules of logic given the axiomatic method of mathematics i.e. some pre-established axioms are appealed to whose semantic contents are merely formal other than material in generating a proof such that we therefore say that a sentence is formally true without wishing to say it is actually true.

The application of mathematics to logic (mathematical logic) led to the emergence of two interpretive theorems namely soundness and completeness theorems. The soundness theorem states that no incorrect deductions can be made from the inference rules if we take "correct" to mean the meanings of our sentences. The completeness theorem on the other hand states that every correct deduction that can be expressed in the system can actually be made using a combination of the inference rules provided. The first theorem calls for the proof of consistency and non-compatibility of the individual rules of inference (assuming them to be axiomatic), while the second calls for the proof of completeness of the system (again, assuming such system to be axiomatic). These two therefore become mathematical theorems because to prove them, there

is a need for an algorithm. So we see how logic grows from being a discipline or tool of philosophy to a branch of mathematics simply by adopting the method of mathematics.

Much as an eclectic optimist may claim that the journey of modern logic into mathematics has been fruitful, the fact remains to be disputed that every future development of logic would inevitably be a footnote to a development in mathematics. This is a muffling of a discipline into a theory in another discipline and a stifling of its independent progress. David Hilbert writes that "as long as a branch of science offers an abundance of problems, so long is it alive; a lack of problems foreshadows extinction or the cessation of independent development" (407). The subsumation of logic under mathematics foreshadows extinction to its independent development. This is because its concerns and its problems would ultimately be those of mathematics without any independent focus.

Our call here for a return to deduction and induction and maybe their advanced development as logical methods rather than the blind embrace and adoption of mathematical method is worth a second thought by any logician. The impression this creates is that logic is losing ground to mathematics. It is not out of place to adopt a mathematical method in a satellite development of our discipline but it would be out of place to make it the central and sole method of logic. A nervy implication to this is that the future development of logic would be determined by the developments in mathematics. We have seen the Cantor's continuum, the Diophantine equation, the Fermat's problem, the Hilbert's compatibility of mathematical axioms to mention a few becoming the occupation of logicians after the mathematicians had laid them to rest or at least given them the full measure of their strength. Therefore, to do as little as discover or advance own methods for modern logic would not only restore the disciplinary status of logic but would open it up to measures of parallel development with other disciplines. Under this influence, logicians would be able to plot an open, broad view and independent development of their subject and get to a stage at which they would find an economically viable career in it.

**Ududo Reasoning as a Postmodern Formalist Method for Logic**

Disorganization that leads to organization is the way of a spider. Sometimes, we reason from seemingly disorganized premise but in the end arrive at an organized conclusion. Let us first define reasoning following Gilbert Harman (107) as a logical procedure for revising our beliefs, changing our views and which determines which new beliefs we acquire and which old ones we set aside (where the procedure referred to above simply means a set of axiomatic rules or formalist rules). This therefore, does not exclude non-axiomatic procedures like formalist structures which employ simple non-axiomatic rules in putting thoughts

into logical perspectives; insights into the latter are actually the main thrust of this essay.

The relationship between reasoning and logic in African thought is cordial in that reasoning functions as a tool of logic while logic remains a framework for reasoning hence reasoning is considered rigorous if it is logical. Being logical roughly speaking simply means adherence to laid down axioms, formalist rules and other logical laws in the arrangement of thought.

In their thought system, Africans of different tribal backgrounds believe and hold the view that reality exists in a network of interconnection. This is why their ontology makes most of the collectivity rather than the particular; and group identity rather than individual identity. One exists only in a group; to be ostracized is to cease to exist. Let us remember also that in African thought variables are concrete realities and not abstract signs, so they too are in a network of interconnection with the operators bringing them in contact. This means that variables that are not connected through one operator could be connected through another.

Ideally, the Ududo or Cobweb is one framework of logical reasoning which captures the African idea of interconnection of realities in a non-axiomatic way. Thus using it as a framework for reasoning, Ududo shows how our beliefs and views are related, how we acquire new ones, how we set aside old ones and how we place them in proper logical perspectives. The ones we set aside we may reacquire and the ones we acquire we may set aside later as contexts and circumstances demand. Below is an example of Ududo reasoning:

*Unquantified argument structure*

$$D \quad \mapsto \quad Q$$

$$Q \quad \leftmapsto \quad C$$

$$C \wedge Q \quad \mapsto \quad D$$

$$\therefore (D \wedge Q) \vee (C \wedge Q)$$

Here we start reasoning with the first term placed at the centre of a circle within a square box thereafter other terms could be placed in any type of box other than a square and the uniformity of each box maintained throughout. This is to give direction to the reasoning. In Ududo reasoning every operator is represented with a unique type of arrow for example:⊢→becomes →, ⊣ ,turns to← ; ∧ becomes ↙or ↗;∨ becomes ↘ or ↖; ~ turns to →or ←, ⇔ becomes ←→; while ↓signifies a drop down of a unary variable. Additional rule of the thumb is that inferences of wedged-implication are ideally done towards the right while those of wedged-reduction are done towards the left to ensure clarity. Also ►► or ◄◄ or ↑ or ↓signify therefore or conclusion.

**Fig. 1:** **Diagram of ududo reasoning**
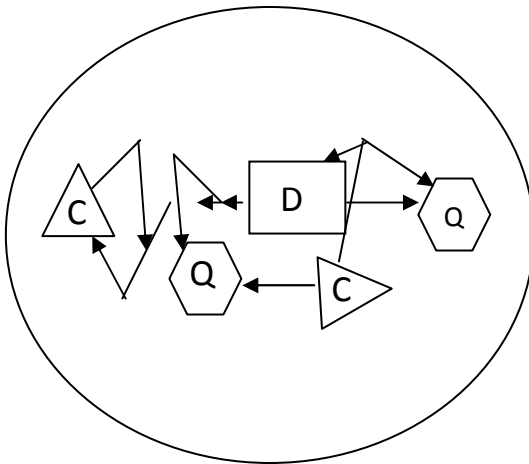
Valid and sound**:**

We see that this argument is sound because the premises are relevant to the conclusion. The premise C wedge-reduces to Q has an arrow connection to the first premise D wedge-implies Q. But the fact that the first premise does not

connect directly to the second in that order also shows that the argument is inconsistent therefore valid. Relevance primarily determines soundness. Ududo reasoning thus is a viable apparatus for determining the soundness of arguments from a formalist perspective. For an argument to be sound the arrows must connect the premises and the conclusion and for it to be valid, the connection of the arrows must not be properly ordered. This reasoning format therefore succinctly exposes and clarifies the muddy case of validity without soundness.

## *Quantified argument structure:*

$GHy\ Jy \wedge Dy$
$KWx\ Bx \longmapsto Cx$
$GBz \sim Jz \vee \sim Cz$
$\therefore GHy\ (Dy \wedge \sim Jy) \vee (Bx \wedge \sim Cz)$

Fig. 2: Diagram of quantified argument structure
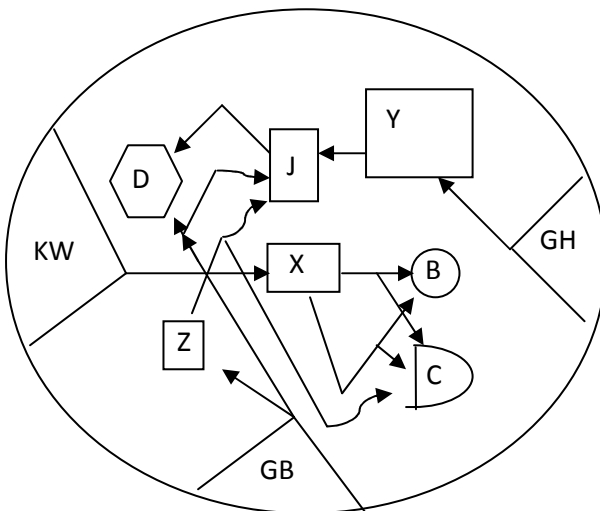
Valid & Sound:

Here we begin by placing the quantifiers in triangles at the left, right and then the bottom sides of the Ududo. Note also that in line with the reasoning pattern of

Ezumezu logic, the group comes first before the individual hence the KW, GH and GB take placement in this order.

## *Evaluated argument structure (improper)*

1.      T (J   $\mapsto$   K)

2.      T (Q $\wedge$ J)

3.      F (K) :. (Q $\wedge$ K) $\mapsto$ (J $\wedge$ K)

Fig. 3: Diagram of evaluated argument structure



Valid & Sound.
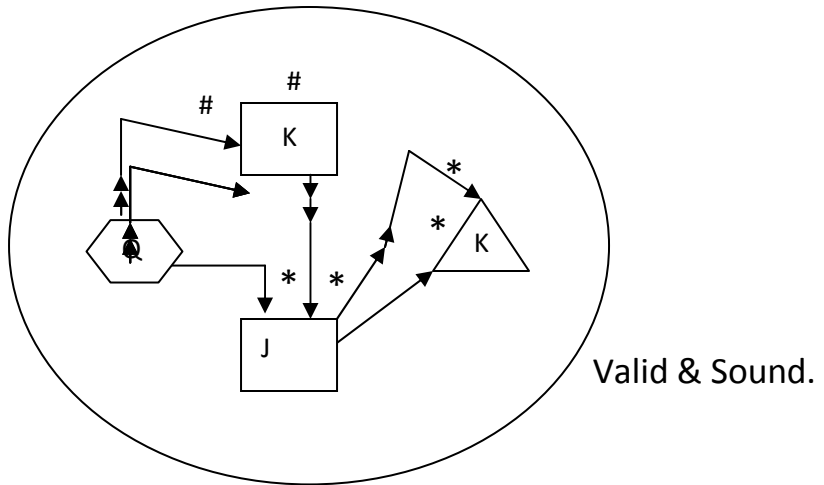
Our variables are J, K*, Q, K$^{\#}$

In the above, we use * to designate true prepositions and # to designate false ones while "C" would designate the complemented proposition. The argument is sound in that there are arrow connections which show the relevance of the premises to the conclusion and it is valid in that line two shows inconsistency in the ordering of the arrow connections. To be well-ordered line one would have to connect line two and not the other way round. The major operator in the conclusion $\mapsto$ is true because where the agbọ-ochie is false and the agbọ-ọhụụ

true, Ezumezu logic shows that the wedged-implication is true due to the principle of existential possibility. In the conclusion lines indicated by $\updownarrow$ , the agbọ-ochie $Q \wedge K$ is false because one of the ejima $K^{\#}$ is already shown to be false, and the agbọ-ọhụụ $J \wedge K$ is true because an established premise $J \longmapsto k$ already shows the variables to be true. Note however that this is not a full-blooded argument in Ezumezu logic because it is not properly evaluated. A properly evaluated argument in Ezumezu logic must have three values because Ezumezu-African logic is strictly three-valued.

# Conclusion

This Ududo proof apparatus is therefore formalist in method since it is devoid of axioms. It is also postmodernist in structure since it portends a non-standard logical system in the mold of Ezumezu logic. Generally, it retains symbolism but takes it to a new level with the introduction of graphics. The graphics then by their involvement draws logic closer to subject matter while not tearing it apart from form. It is in exercises like this that the subject of modern logic would be redefined as a discipline rather than as a branch of mathematics. Hence, Ududo reasoning can be described as a formalist method with a postmodernist flare. The goal of this essay therefore was to propose a formalist method for logic that is at the same time postmodernist in keeping with the postmodern ideal of creating alternative frameworks and breeching the walls of static hegemonies in thought.

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