

ARTS AND SCIENCE EDUCATION: A NEED FOR SYNTHESIS

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Abstract

The modern day tendency to emphasize the study of the science as preferable to the arts posits the basis for this paper. It is a research into the nexus of Arts and Science as complementary disciplines for meaningful education. The paper reviews some thought positions on the two disciplines. It looked back to the early century Greek, Roman and Egyptian education to make appraisal of arts education as preliminary to the study of the sciences. The paper made a simile of development in Arts and Science as development of mind and body. It concluded on the need for stakeholders in education to place equal premium on the two disciplines.

Preamble

The questioning mind more often than not, emerges as the creative mind. This is because the mind introduces to the intellect ideas or thought made out of wanderings and ponderance over matters and requires the intellect to ascertain the truth of the matters and possibly, explore further truths. A decision to do something or act in a special way is a response to some interrogations that first occur in the mind. Such interrogations may or may not be overtly expressed as they form the basis for trying out new ventures or explorations. They generate some configurations that introduce new initiatives. This is an instance of thinking in the art. The modern day overzealousness for the study of the sciences in preference to the arts poses a conundrum. Much as one would appreciate the offerings of the sciences for development, it becomes fuzzy to imagine the impact of science without the arts as its complement. The sciences expose realities while the arts offer the language and logic to explain them.

In principle, the sciences lay bare facts and figures about nature as well as their established relationships. Further discoveries are usually made through trial and-error experimentations. Sciences are more often learnt in this way but learning as a cognitive experience is an art. It is achieved in the mind of a person through questioning on some known realities to discover the unknown. Cognitive interrogations unveil to the mind a quest for some realities which should have otherwise, remained unknown. It becomes disturbing when education is appreciated only to the degree to which one possesses knowledge of the sciences while the study of the arts is given a second place. This allegation is evident in the 60:40 ratio of admission in favour of the sciences as practised in Nigerian school system. Besides, different schools or colleges of sciences, as named, are established in addition to the conventional institutions that study the sciences along with other disciplines. This problem seems to be universal. Koopman

(2005) remarked thus, perhaps, there is no domain of education in which the issue of justification is so prominent as in arts education. The reason for this is the precarious position of the arts in general education. Arts educators are engaged in an ongoing battle to prevent the arts from being further marginalised or even removed from the curriculum.

Indeed, one could feel the precarious position of the arts, going by this remark. The notion of on-going battle by arts educators to prevent the arts from being marginalised in the school curriculum is expressive of the enormity of the problem. One could submit to this impression that it is an empty embrace of the sciences to cast aspersion on the arts since there is no way to study the sciences without the involvement of the arts. Language and logic among other things, are prerequisites for the study of sciences. These are in the realm of the arts.

This issue becomes more magnified at higher levels of learning. Suissa (2006) for instance, lamented on her experience of research in education in which the understanding of education is scoped exclusively down to versatility in adhering to established formats of science as against the arts. She said, Like many of my contemporaries in philosophy of education, I am suffering from something of an identity crisis. I am not referring to the way in which we find ourselves slung between various positions in the debate, within our own academic community, over what philosophy of education is ... I first became aware that this field was fraught with problems when as a Ph.D student, I was required to attend a number of core courses on the Research Training Programme at the Institute of Education ... It soon became apparent that I and the couple of other philosophy students were a bit of an anomaly in these fora.

The universal spread of the problem is depicted in the first statement which puts her experience as a share in the experiences of her contemporaries. The sciences seem to promote fixidity of thought derived as the output of observations and experimentations as distinct from the arts which encourage flexibility of thought derived through on-going interrogations in the mind.

Bandeled (2004) insinuated on philosophical research and even on philosophy that it is a discipline that does not recognise the existence of problems. He concluded that philosophers create more problems than the ones they solve, but concluded on a paradoxical note that some problems in education are better resolved through philosophical arguments and methods. This position is an instance of castigating the arts to the embrace of scientific ways of making research. Notwithstanding the apparent contradiction in his opinion that philosophers do not admit the existence of problems and yet, some education problems await the use of philosophy to solve, one point to strive here is that philosophy, like other arts differs from the sciences in its focus and approach to research or learning. This point perhaps finds a backing in Bridge's (2003) contention that philosophers are rather uncomfortable with defining what they do

as research in the face of the dominant position that research is scientific. This contention led him to state two options; either for philosophers to admit that they do not engage in research making or to redefine the concept of research to accommodate the philosopher's enterprise. One would contend that the latter option is more feasible.

The remarks made about philosophy equally apply to other Arts subjects such as History, Literature, Archeology, Language, Anthropology, Religion and the humanities in general. This position paper would critically examine the place of arts education as a complement to science education

Arts Education in Retrospect

The artistry of thinking expressible in speculating, imaging, discerning, appreciating, among others is as old as man himself. Our attempt at looking backwards on Arts education would briefly examine its status in some ancient kingdoms. For instance, thinkers that originated from Greece were noted for the learning of arts. These thinkers included Socrates, Plato, Aristotle among others who were philosophers. Greek education was stuffed with music, literature, drama, politics, philosophy and other school subjects such as language rhetorics, dialectics, music, arithmetic, geometry, astronomy and politics. The aim of the Greek education was to train balanced personalities who are intellectually and morally sound and could be creative. The arts was perceived as basic to forming such personalities. The Greek poetry and drama were of significance in developing speculative thinking and training the mind in discernment of values.

Like the Greeks, the ancient Romans show a flare for the arts. Roman schools were particularly committed to the teaching of the arts and rhetorics. The school curriculum included language, literature, rhetorics and creative arts, among others. Education for the Romans should exhibit good citizenship and proficiency in rhetorics, and should be utilitarian. The ancient Hebrews shared the same philosophy with the Romans and the Greeks on the teaching of the arts as a means to formation of pupils in good citizenship. The school curriculum consisted of creative arts, language and religion among others. (Ajibade, 2005: 1-4)

The African kingdoms are not left out of the culture of arts education as could be found in the formal education of ancient Egypt that emphasised the teaching of writing (hieroglyphics), painting, architecture, politics and medicine, among other subjects. Training in arts was considered to be an essential part of basic education. This was engaged in by both parents and teachers. Nigeria like other nations in Africa, counts within the practice. Education which is oriented towards the development of the whole person, consists in the acquisition of skills in Writing, Reading and Arithmetic. Acquisitions of skills in these areas are considered foundational to knowledge and experience in other areas. Fafunwa (1980) made a list of values expected of the education process. These include understanding basic facts about health and sanitation, promotion of one's cultural

heritage, acquisition of vocational skill and development of ethical character, amongst others. These values are hinged on the first three mentioned by him. They are:

- a. To think effectively
- b. To communicate thought clearly
- c. To make relevant judgments

One could see that these three values reflect the artistry of sound education as they are the immediate yardsticks for assessing an individual as educated. Again, Fafunwa expatiated on this point when he said: “The first three accomplishments mentioned above are those which any well educated individual at any level is expected to possess:” One may add by way of remark that noticeable deficiencies in any or all of these three expected outcomes could give rise to controversial opinions on the rise or fall in the standard of education of any nation.

The three values are best developed through intensive study of the arts since they are products of the workings of individual minds as the arts are. Other educational outcomes are relatively arts dependent. Fafunwa again testified to this in his explanation of appreciation of culture as a research accomplishment when he said: “The seventh point which must be stressed is the need for the African to appreciate his own culture. African music, African art, African literature, and African history are still strange to many Africans who are more familiar with the European arts.” The striking point here is the permeating feature of the arts subjects as subsets of culture. It therefore becomes enticing to see the study of the arts as basic to the study of any other subject.

Interrelationship of Arts and Science Education

School subjects are commonly classifiable into two in respect of orientation and focus. These are the arts and the sciences. Several disciplines develop within each of these family subjects. Our reference to the study of the sciences shall be in broad terms, paying little or no attention to particular fields of science. Our concern is what the study of science has to do with the study of the arts. In the practice of western education, school subjects are structured to cover a wide range of human experiences. The focus of learning is the human being and his environment. The various aspects of the sciences such as Biology, Physics, Chemistry, Mathematics, Astrology, among others were formalized for teaching as school subjects along with the social sciences and the humanities. Thus, there was what used to be known as natural sciences as distinguishable from the social sciences. The division and subdivision of the sciences into specialties as observed by O’Connor (1980) was a practical device to meet the limitations of man’s mind and the shortness of his life. This, one would agree with him, is due to the fact that the field of scientific investigation is too vast and complex for man to understand.

Educating in the sciences, for instance, assumes taking learners through vast experiences on the nature of man, the society and the entire universe. This may simply be reducible to recognition of matter and form and exploration of causality. Scientific knowledge comes about through sensual recognition of matter and the form it takes and inferences on relationships. Scientific study may be classified into speculative and practical, depending on the dimension of emphasis. Speculative science is purely cognitive. It is concerned with recognising existence of matter and its form. Practical science on the other hand, is concerned with doing. This is ability to demonstrate through experimentation the relationship between matters, their forms and discover the potencies that subsist in them. The two dimensions are complementary in the sense that one gives meaning to the other. The speculative sets a preparatory ground for the practical while the practical translates speculations to realities. Science would be best taught and learnt in lieu of the two dimensions. Similarly the study of the arts exhibits both the speculative and the practical dimensions. The practical dimension consists in naming the recognised matter to its form while the speculative consists in appreciating in language the values that may be made out of matter and form. The two dimensions exhibit in rational judgment on values. However, scientific study assumes the practical as its main outward characteristic while the arts assumes the speculative.

Education as an academic discipline, may not be referred to as a science to the exclusion of the arts. As an intellectual activity, it involves the inputs of both the arts and the science. The art element of education consists mainly in thinking while the scientific element presents it as a product of activities. Knowledge comes through science when scientific propositions are subjected to empirical verification, but knowledge does not rest on empirical evidence only; it requires the input of reason to make sense offerings meaningful and understandable. This spells out a meeting point of arts and science in knowledge inquiry. Science provides materials for the thinking process while the arts provide the logic for the truth of knowledge and its relevance to human need.

Philosophy, which provides a base for education carries along both the arts and the science in its focus and method. This has a bearing with knowledge that carries the two-faced dimension of the arts and the sciences and philosophy dwells principally on knowledge, among other things. Aristotle, for instance, discussed not only rational issues about the nature of man, knowledge, morality and value; he also examined scientific questions about the constitution of the universe, the nature and organisation of the physical environment and the mechanism of sensation among other things. Philosophy integrates the arts and the sciences for the education process. O'Connor (1980: 19), again, attested to this in his claim. He said: "All sciences started as branches of philosophy in the sense that the Greek work 'Philosophia' was originally used in a very general sense to cover all investigations into the nature of man and of the universe." One could add further to this that the field of scientific knowledge is inseparable from

the philosophical one in so far as both philosophy and science require the use of human reasoning to establish the truth of knowledge. Differences may arise in methods of knowledge inquiry, notwithstanding, reasoning is a crucial factor to education in the arts and sciences. One applies reason to speculations as well as to sensations. Speculation is an essential feature of the arts while sensation is essential to the sciences.

A question now arises: To what extent does knowledge of the arts blend with knowledge of the sciences? This question may be reduced to inquiry about the blend of reason with sensation. To answer it, let us begin first with sensation. The sense organs are acknowledged sources of information but our senses do not function the same way and at times, they can deceive us. The deficiencies that may be experienced to some degree, mar the quality of perception made from sensations. This inevitably makes a serious difference in the experiences derived from individual perceptions. The mind at sensation receives sense impressions which are interpreted as information and are usually connected with previous experiences. Previous experiences differ in content and quality among people hence, sensual offerings may be interpreted differently among them.

As regards employing the use of reason to gain knowledge, the act of reasoning is a personal experience by the individual thinker. To validate knowledge acquired through reason, there must be a plausible way to make out the truth of knowledge from propositions. This inevitably entails logical organisation of ideas. Reason becomes an effective tool for knowledge when it accords with the laws of logic. Reason and sensation as means of knowledge acquisition are therefore complementary. This is a basis for the blend of the knowledge of the arts and knowledge of the sciences. For instance, most philosophers since the seventeenth century were experts in the sciences; examples include Descartes, Spinoza, Locke and the British empiricists among others. They make issues and problems in science explicit concerns of philosophy and see philosophy as integral to scientific thinking. In this way, they make one see the arts and the sciences as complementary subjects in education.

Justification for Education in the Arts and the Sciences

Controversy could arise as to whether the disciplines of the Arts and the Sciences should weigh equally on the learning scale considering the modern day trend of emphasizing science education to the point of marginalizing the arts. For instance, in an edition of *The Guardian* newspaper, (Tuesday, June 26, 2007) a report was made of a Nigerian state governor's attempt to ban the study of the Arts in the schools. This inevitably was met with criticisms (*The Guardian*, July 2, 2007). This issue here is beyond emotive response as to which position is more appealing, whether to retain the study of the Arts in the schools or not. Let us make an objective quest on whether the study of the arts is eliminable in education or not. Knowledge, which is the core of education has been argued to carry the dimensions of both the arts and the sciences. Based on this point, the

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suggestion to eliminate the arts from the school curriculum would therefore create a yawning gap in education.

The right to rational thinking should be the prerogative of the individuals that are engaged in the education process. This point is expressive in Bleuler's two-faced dimensions to thinking which he termed "the Autistic" and "the Rational" (Mckellar, 1968). Autistic thinking is self-generated and fantasy-controlled. Examples are nightmares, hallucinations, dreams, self-initiated visions and auditions, amongst others. This form of thinking is unscientific because its validation is not based on facts and figures. It is simply the artistry of the mind to conjecture and configure impressions. Anything can come within the human impressions and not all impressions become knowledge. The rational thinking however, is the scientific experience of sifting and sorting out ideas of realities. It tends to objectivity of thought and knowledge appears to be best made out in this way. Examples of rational thinking include critical evaluations, appraisals and logical inferences amongst others. The human perception from which knowledge derives, embraces these two forms of thinking. Both are symptoms of the arts and the sciences in the knowledge-seeking encounter.

Similar, Blender's theory is the theory that the human brain which is the seat of intellectual activities is identified to carry two hemispheres simply tagged the "Left" and "Right" hemispheres. (Wonder and Donovan, 1984). Every human being possesses these two hemispheres but leans more towards one of them, thus there are left brain thinkers and the right-brain thinkers as one may describe them. By analysis, the left brain thinkers exhibit qualities of being positive, analytical, explicit, verbal, rational and argumentative among others, while the right brain thinkers exhibit qualities of being symbolic, artistic, playful, emotional, spontaneous and infinitive, among others. The left hemisphere one would say, is the rational side of the human brain while the right is the autistic going by Bleuler's classification. The left hemisphere disposes the human being for scientific thinking, while the right hemisphere carries potency for thinking in the arts.

The contention that every human being carries potency for thinking in the arts and the sciences justifies the need for equitable embrace of the two disciplines. Education itself is a science, as well as an art and research in education carries the traits of both. The scientific elements in the research consist in recognizing variables and taking steps to manipulate them for a desired result. This is the empirical way to research. Oftentimes, the empirical knowledge-seeker raises questions and hypotheses to make out facts and figures to be established as knowledge. While the sciences offer knowledge of facts and figures, the arts complement this with the language and logic of discourse.

Caranfa (2006) making reference to a commission on the humanities in American life that was set up in 1980, enumerated some values of the art. These are summed up as fostering logical and analytical skills which could enable students to analyse, criticize, and assess ethical problems, issues of public policy,

and the question of the value that underlies science and technology. It becomes appealing to describe the arts as the value at the base of the sciences. The arts do not only form a base for the sciences, they also offer the materials with which they function. The discoveries of science are made to bear upon human condition through the appreciation of their relevance. For example, the discovery on sources of heat may not be sensible unless its relevance to man is established. Its functionality is determined by the degree of its application. One can only do this through analysis, criticism and assessment of values of heat and one needs the appropriate language to do this. This again is the involvement of arts in the study of science.

Plato in his *Republic* once gave a pointer to the blend of the arts and the sciences. According to him, a holistic education must harmonize the mind with the body. The arts essentially focus on the development of the mind while the body depicts the focus of scientific studies. Plato contended that the arts draw the soul along the path of beauty of reason at a child's early years and this prepares him to be noble and good later in life. The nobility is expressible in how well he learns to relate with others and the environment. The sciences stand to teach this relationship. Aristotle in his *Nicomachean Ethics* claimed that action is good and righteous when reason is true and desirable. Education should teach a person how to act ethically and in truth. According to him, other emotions and sensations bring us in conflict with our object of desire but reason determines whether the object could bring pain or pleasure. The arts promote ethical judgment on moral skills. It is both instructive and pleasurable. This point reiterates the foundational nature of the arts to the study of other subjects, particularly the sciences.

Some writers of the middle ages, Edgar de Bruyne (1969) and St. Augustine (1963), for instance, christomised the philosophy of art. De Bruyne attributed to it the joy of contemplation while Augustine saw art as essentially the rhetoric of silence that instructs in matters connected with the divine. Both views re-establish the value of arts as essentially focused on the development of the mind which is a prerequisite for the development of the body.

Conclusion

The nexus of arts and science as complementary disciplines as discussed so far, challenges educators and other education stakeholders to place equal premium on both of them. The impression that the sciences deserve a higher premium over the arts should give way to the fact that school education is expected to foster holistic development. The arts and the sciences could offer this only when they are studied together.

Although one may not advocate the development of expertise in both disciplines at the same time, yet one would assert that it is very difficult to attain expertise in one to the total exclusion of the other. The school curriculum should reflect the synthetic nature of arts and science. For example, the study of the sciences should have at its base some knowledge of arts subjects such as history,

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philosophy and language. Conversely to study the arts, would require the knowledge of laws of nature and the functioning of some things or nature as studied in the sciences such as Physics, Mathematics, and Biology amongst others.

The common experience of establishing universities and colleges of technology to overemphasise the importance of science education leaves one to perceive questionably the one-sided approach to interest in human development. In spite of this, a keen observation of the programmes of study in these institutions reveal the indispensability of the arts to the sciences in the sense that courses in arts such as language, history and philosophy are structured into the science curriculum. The complementary study of arts and science should begin right from the elementary school and should be intensified at higher levels. This is by stipulating equitable proportion of learning the two disciplines. One believes that if this is done, the school would produce well exposed and balanced citizens who would be capable of creative and productive thinking as every nation needs.

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