Multidisciplinary Consciousness: A Spur for Intellectual Creativity and Collaboration

By

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Abstract

The objective of this research paper is to provoke renewed interest in multidisciplinary research and collaboration among academic researchers. The paper is in seven parts, with the first being introductory remarks. Next is a brief discussion of the critical terms of the study which is followed by analytical insights on why academic specialization should be conducted in a manner that makes room for multidisciplinary collaboration. Other topics explored by the study include the root of scholarly insularity and the need to ensure that learning at the universities is carried out in a focused and inclusive way. The last two parts of the study draw upon concrete disciplinary linkages and examples to underscore the fact that academic researchers, via multidisciplinary collaboration, can benefit from the inter-related and inter-dependent nature of scholarly research. The paper is an expanded and updated version of a short commentary on the subject earlier written by the author.

Keywords: multidisciplinary, academic research, collaboration, specialization

Introduction

The twenty-first century demands that scholars should have a broad understanding of what is happening in disciplines other than theirs. Although this need has always been there, it is now critically important due to the unprecedented developments in various fields that have altogether expanded the frontiers of knowledge, in theoretical and applied terms, beyond the traditional boundaries of many academic disciplines. The main triggers of this phenomenon include not only scientific and technological innovations but also the invasive force of ICT, especially the internet, and the complex nature of contemporary social issues that demand collaborative multidisciplinary approaches before they could be adequately understood, managed or solved.

While the intricacy and interwoven nature of our 21st-century world may necessitate some reform in the way courses are taught in our universities in order to promote cross-disciplinary learning among the students, it also demands that university teachers should develop the habit of peering into developments in other fields of study. There is need for acquisition of a multidisciplinary mindset – the capacity to see, appreciate or be open to enquiries that pertain to other relevant aspects of a matter. Such a multidisciplinary interest, even if occasionally indulged in, can broaden research perspectives, open fresh vistas of collaboration and, perhaps, throw up unexpected solutions to some supposedly discipline-specific challenges.

Definition of Terms

In strictly definitive terms, multidisciplinarity is distinct from interdisciplinarity. According to Choi and Pak (2006), "Multidisciplinarity draws on knowledge from different disciplines but stays within their boundaries. Interdisciplinarity analyzes, synthesizes and harmonizes links between disciplines into a coordinated and coherent whole." The prefix, "multi", in our context here, is used to unify both terms as each of them involves links between two or more disciplines. Multidisciplinary consciousness is required to initiate such linkages or multidisciplinary collaborations. Ajakaye & Ogunniyi (2021) have explained some aspects of this view of multidisciplinary collaboration:

> Multidisciplinary approaches involve drawing appropriately from multiple disciplines to redefine problems outside of normal boundaries and arrive at solutions based on a new understanding of complex situations. Multidisciplinary can also be defined as a particular relationship existing between disciplines or collaboration of a few disciplines around the joint theme. Therefore, it is where two or more academic disciplines collaborate for a specific purpose, for instance, when computer scientists, psychologists and sociologists cooperate in the design of human/computer interfaces, use of skills and knowledge from the disciplines mentioned.

In practice, multidisciplinary research engagements often cross boundaries and may result to holistic integrations and outcomes. This is why this paper uses the term "multidisciplinary", in a rather broad sense, to include interdisciplinary and even transdisciplinary (that is, beyond disciplinary) interests and approaches.

Balancing Specialization and Multidisciplinarity

Although the *university* system offers each programme of study as a distinct course, the prefix "uni" (meaning "single" or "one") appears to support a narrow pursuit of a singular course of study or skill set. While a university is

set up to produce people knowledgeable and skillful in their chosen fields of endeavour, many a disciplinary content is conceptually too restrictive or too narrow in its approaches to solve some complex academic or real-life problems. Of course, specialization in a focused area of study has undeniable benefits, especially in terms of the competence in or mastery of a given field it delivers. However, implicit and explicit in that focus is the exclusion of other precincts of knowledge, conceptualizations and approaches.

The Root of Scholarly Insularity

There are insufficient cases of multidisciplinary cooperation in our universities, and this is largely due to the restrictively inward-looking way courses and academic enquiries are constructed and conducted and also due to students' shallow or erroneous preconception of the courses they are admitted to read. As a result of these, among other institutional reasons, many people who graduate and choose an academic career do so without a deep understanding of the fact that although "every discipline constructs, organizes, and communicates knowledge differently" (Stoller & Stansel, 2021), there are areas in which many disciplines overlap. This means that though disciplinary perceptions and methodologies are bound to be different even when tackling the same problem, a number of research objectives can still benefit from multidisciplinary collaboration – a need seldom felt and met in our universities because of the way many lecturers cocoon themselves in their departmental chambers. While multidisciplinary exertion may or may not enhance an academic's titular climb, it holds an invaluable key that could open remarkable doors of creative thinking, paradigm shifts, innovations, and game-changing solutions to thorny life issues. Sometimes, multidisciplinary understanding and applications can even extend the edge of a scholar's initial discipline or throw them, with pioneering eminence, into the frontier of new field of study.

Enhancing Broadminded Academic Pursuits

While retaining the necessity of taking university students through the corridors of compartmentalized learning, it is important to cross-ventilate them with some basic understanding of what is happening in other fields of study, including artistic, scientific and technological fields. The compound word, university (uni+versity) possesses an interpretative scope adequate enough to accommodate multidisciplinary cooperation. Conceptualized as "single", we have in "uni" the student's unit of primary concern – their major course, if you like. However, when "uni" is interpreted as "one", this linguistic element becomes somewhat expansive as it merges etymologically with the root word *ūniversus* (Latin for "whole") to include the various points of general interest, acquirable as concepts or tools, that could augment the student's navigational capacity in the real world.

In essence, every university degree should be a focused area of study that accommodates real-life-enhancing understanding of other vital areas. Cohered in *ūniversus* is the idea of "universal", especially in its usage as wholeness of separate but connected things or ideas. In this sense, therefore, a university ideally should be a universe of ideas constantly tested for veracity or practical relevance by systematic research and/or experimentation. It is often in pursuit of this academic or problem-solving enquiry that academic researchers usually see the need for conceptual linkages and applied connections across disciplines that would enable them to gain creative insights, drive innovation and development and, possibly, achieve utilitarian results.

Being impassioned to solve a real-life problem can ignite, in search of solution to that problem, a scholar's interest in multidisciplinary collaboration and this, in turn, can fertilize a scholar's ideas or unleash their creativity in new directions. Awareness of what is happening in other fields broadens a scholar's mindset or vision beyond the narrow zone of their primary academic concern. It boosts the hatching of fresh insight, widens the circumference of one's points of reference, thereby enlarging and deepening understanding.

No Course is an Island

Adapting John Donne's ageless quote, "No man is an island" (Donne, 1624), one can assert that no course of study or academic enquiry is an island. In spite of differences in subject area, focus, methodology, and categorical frames of reference, connections exist among various academic fields. The humanities, for instance, cover areas such as Language and Literary Studies, Linguistics, Philosophy, History, Fine and Applied Arts, Mass Communication, Theatre Arts, Filmmaking, Music, Academic Study of Religion, Media Studies, Cultural Studies, and Culinary Art. Each of these seemingly distinct areas share affinities with each other and with disciplines traditionally placed in other categories, such as education, medicine, technology and the social or physical sciences. Hence, we speak of food technology, medicinal diets, the political science of teaching and learning, socio-linguistics, media communication technologies, the philosophy of science, and the cultural studies of science, which, according to Rouse (2015), is

> a multidisciplinary field drawing from history, anthropology, feminist theory, sociology, and philosophy of science, treats scientific practices as historically situated, meaningful patterns of interaction with the world.

Although language studies are classified as arts, conceptions of meaning and meaning-articulation (Rouse, 2015) cut across all disciplines.

The social and management sciences, because of their contextual complexity, may be deemed more subjective than the medical, engineering, environmental

and physical sciences but they all share certain processes and analytical tools. Their datasets can be connected because they commonly use qualitative and quantitative research that may entail the deployment of statistical models. Although the physical and applied sciences rely more on causal and diagnostic research, there abound linkages between them and the social sciences. Weidlich (1991) has explored the synergy between physics and the social sciences. In his book, *Physics and social science — The approach of synergetics*,

> Universally applicable methods originating in statistical physics and synergetics are combined with concepts from social science in order to set up and to apply a model construction concept for the quantitative description of a broad class of collective dynamical phenomena within society.

His "systematic approach to mathematical modeling in the social sciences" presented "A general concept…which allows of setting up mathematical models for stochastic and quasi deterministic dynamic processes in social systems" (Weidlich, 2000).

As we can see, there are various ways in which certain topics or areas of research can be connected across different disciplines.

Examples of Multidisciplinary Interventions and Outcomes

One good thing about having a multidisciplinary consciousness is that it could lead the academic researcher to draw inspirations from unexpected or seemingly remote quarters. A cynic may ask, "What benefit can a post-graduate student of English derive from reading a paper on statistical methods?" The answer to this question is now history. In the 1930s, statistics enabled Gray and Leary to locate and measure variables of writing style (Danielson, 1987). Their effort produced a prescriptive procedure. Inspired, Rudolph Flesch did further research that resulted into his 1943 PhD thesis, *Marks of Readable Style*. Aided by statistics, Flesch reduced his findings to numerical data and made them formulaically applicable. That marriage of language and statistics, known to have improved reading ease by up to 60%, became so popular that Microsoft, years later, adopted it and is now using it to calculate the readability scores of MS Word documents.

Great scientists and thinkers have identified culture – macrocosmic culture – as the common source of all knowledge. In 1937, Albert Einstein said in an essay he wrote on moral decay, quoted by Skorton (2018):

> All religions, arts and sciences are branches of the same tree. All these aspirations are directed toward ennobling man's life, lifting it from the

sphere of mere physical existence and leading the individual towards freedom.

Students of each of these branches can learn a lot by occasionally tasting the fruits of each other's research. After all, the fundamental difference between artists and scientists is not in either group's aversion of the truth but, rather, in their preferred approaches to the determination of the truth. Whereas those in the arts proceed from the imagination, scientists largely begin their quest by taking the empirical route.

Even these two approaches need not be mutually exclusive. Empiricism, creatively employed, can make the work of the arts scholar more predictable without necessarily sacrificing its unique flavour. In the same vein, the scientist's fortuitous acquaintance with an artistic research can spur him to attain some height of epiphanic imagination. "Every great advance in science," according to Dewey (1929), "has issued from a new audacity of the imagination."

This view is supported by the father of quantum theory, Max Planck, who insists that the ground-breaking scientist must possess "a vivid intuitive imagination, for new ideas are not generated by deduction, but by artistically creative imagination." A good example of this is website technology's use and popularization of the word, "breadcrumb", a term derived from folklore. As explained by smashingmagazine.com (2009),

> A "breadcrumb" (or "breadcrumb trail") is a type of **secondary navigation scheme** that reveals the user's location in a website or Web application. The term comes from the Hansel and Gretel fairy tale in which the two title children drop breadcrumbs to form a trail back to their home. Just like in the tale, breadcrumbs in real-world applications offer users a way to trace the path back to their original landing point.

Indeed, many scientific discoveries were made serendipitously. A good example was the discovery of penicillin by the Scottish scientist, Sir Alexander Fleming. In the 1920s, his attention was drawn to some fungi sullying the bacteria he was culturing, and ultimately killing them. That observation radicalized approaches to the study of microbiology and led to the discovery of penicillin, the first antibiotic, in 1928. According to Adkins, Rock & Morris (2018), Fleming's discovery resulted from "the intersection of science and art". According to them, "most microbiologists would have overlooked" the fungal growth "as a commonplace laboratory annoyance". Why did Fleming not overlook it? Adkins et al:

> Throughout his scientific career, Fleming entertained himself by fusing his painter's techniques and his microbiology skills in the creation of agar art. In his lab, instead of using watercolors on canvas, he would paint

with colored microbes on Petri dishes. The microbes would grow from a dilute invisible ink to vibrant pigment-expressing biofilms after a few days, creating living microbial masterpieces. His creativeness and visual acuity is thought to have driven his investigation of contamination he might have otherwise thrown out. Fleming later used a more controlled microbial painting technique – cross-streaking experiments – to verify the lethality of penicillin against a variety of disease-causing bacteria.

The above and other examples of cross-disciplinary interfaces indicate that some of the academic boundaries we construct may be more imaginary than real. As scholars, let us stretch our minds, even if some of the time, beyond the boundaries of our departments and faculties. We may be delighted to see, as Fleming once said, that "one sometimes finds what one is not looking for".

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