


# Chapter 9


## System Science – An Inclusive Model

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### Abstract

This chapter tries to give a review of the current scientific debates from the point of view of the top scholars in the field. The failure of global South scholars to capitalise on system science research has subsequently identified prevailing western-centric scholarship rooted in western approaches and philosophical traditions. The limited scholarship has resulted in prevailing western dominance and cultural expansionism. The dominant general western scholarship has given rise to a singular scientific system in the 21<sup>st</sup> century. While system science subscribes to holistic, inter- and trans-disciplinary scholarship, extensive evidence of a hegemonic, exclusivist and monopolistic tradition prevails. This chapter adopts a desk-top approach that sought to collect data and related scientifically compiled evidence. Desktop research encompasses assembling data from prevailing reserves and is preferred as it is cost-effective and considerably less contentious than field research. Dual forms of online desktop research were used. This chapter confronts the dominant reality to make certain that scholars recognise the value systems in which they are firmly rooted. The modifications offered via a clinical model prevent scholars

from inadvertently becoming custodians of the embedded value system. The inclusion of diverse realities offers equally valuable philosophical traditions, resulting in impending, progressive, and inclusive scholarship. The delivery of a clinical model facilitates an innovative, all-encompassing, and inclusive knowledge method for system sciences; advancing diversity and contrast while augmenting knowledge systems.

## **1. Introduction**

The inability to formulate historical and contemporary system science scholarship propositions in a vacuum gives rise to significant notions of intersection and distinctiveness. Civilizations are embedded in a unique, meticulous philosophical convention, which is supported by propositions derived from the history of the philosophy of science. It is a complex fact that prevailing science is largely a Western ascendancy dominated by related embedded philosophical conventions. The purpose of this chapter is to advocate for collaboration and legitimacy within the field. Using an example from Islamic science, the specific line of reasoning is illustrated.

The concept of hegemonic systems is then reconnoitred, and characteristics of related systems are considered. The system is then employed as an analytical strategy to scrutinize contemporary scholarship in order to demonstrate how it has become compromised and deficient. Finally, the processes of selected philosophies are expounded, allowing global scholars to connect divergent approaches to buttress and underscore existing scholarship. This then ameliorates knowledge absent of hegemonic and monopolistic claims, underscoring an improved advanced scholarship, representative of a multi-faceted globalized world.

## **2. Scholarship and research**

The scholarship review is organised within a particular cultural milieu. Within this time, culture is defined as a civilisation by

Towey (2023), as opposed to ‘culture’ explained as distinct ideas, customs and social behaviours. It may consider modern scholarship as that conducted within a primarily western milieu (in the sense of western civilisation). Rifai (2022) has argued that western science is as much related to western civilisation as Islamic science is related to Islamic civilisation. In line with the above, Aljunied (2022) outlined the examples of how Muslims incorporated Greek thought, and that western science incorporated the learning from Islamic science, which ultimately led to the Renaissance.

Nasr (2022, p. 1) confirms that

“the greatest work of Algebra in the pre-modern period is by the Persian poet Omar Khayyam. When we read his book, of course, if when you get [to a] formula or equation you could be writing in Chinese or English and could be in any civilisation, but the impact that the whole work makes upon you makes you feel that you belong to a total intellectual universe – the Islamic Universe”.

Science is not value-free, but it assumes the values of the philosophical traditions within which it is embedded. Frank (2018) confirms that “philosophy and religion were so intimately tied together in the long march of western history, they both served as the conceptual background for the development of western science”, while Nasr (2022) asserts that it is possible for one civilisation to learn from another, but there is a historical process which includes translation, interpretation, assimilation, modification and integration until the alien knowledge that was received is totally transformed and becomes embedded within the philosophical traditions of and inseparable from the intellectual universe of the receiving civilisation.

Science is a human activity subject to historical and sociological processes. Kazemi (2008) in Shamsaei and Shah (2017) emphasised that

“they lean against tradition and look forward to modernity. They constantly attempt to put a religious

cap on the modern products of the West and introduce them as religious, forming a totally new social necessity. Although, they believe in modernity, but they still consider a vital role for tradition in Islamic societies. In other words, they try to find the new necessities and meanings of the modern world in the context of old, religious texts and imply that the new concepts, such as democracy, freedom, human rights etc., indeed existed in the religious context long before western civilisation came up with them” (Shamsaei and Shah, 2017, p. 881).

The aspect of the inclusive western scholarship is predominating in studies carried out to understand the link between western scholars in education and current implications of understanding education globally. The specific problem is that contemporary scholarly critiques of binaries and local-international relationships in peacebuilding reinforce the same binaries, rather than examine how they came about and with what effects (Danielsson, 2020). Diversity is highly valued in modern societies. Social cohesion, tolerance, and integration are linked to tangible benefits, including economic vibrancy and innovativeness (Al Shebli, Rahwan, & Woon, 2018). The concepts of power/knowledge, epistemic violence, and coloniality are used to analyse how notions of scientific rationality and modernity are deeply entangled with a colonial way of seeing the world (Ideland, 2018).

### **3. Legitimate science in alternate philosophical worldviews**

For the purpose of this discussion, the term science is used, not as restricted to physical science, empiricism, or the scientific method, but in its broadest sense, and interchangeably with scholarship and research. In the previous section science was considered as different worldviews, but it is now accepted that there is a dominant set of approaches of what constitutes good science, scholarship, and research. This dominant approach is that of western scholarship.

Twenty-first century scholarship is a western product, embedded in western philosophical traditions. This section will outline the general characteristics of how science, which is distinct from western science, conducted within a different intellectual tradition, has equal claims to legitimacy. The argument is that every distinctive philosophical tradition could have claims of legitimacy. This chapter focuses on the scholarship of Islamic sciences to illustrate this. Indian, Chinese, African scholarship, or a variety of indigenous knowledge systems spanning various parts of the world could be considered irrespective of antiquity. Indeed, differences in thinking are accepted between the epistemological approaches of East and West. “Clearly, a judicious, empirical approach is needed to try to understand what, if any, role religious ideas, and which religious ideas if so, shape environment-related perceptions and practices”. (Taylor, Van Wieren, & Zaleha, 2016, p. 360).

A distinguishing feature of Islamic Sciences is that it posits that human beings can come to know through a variety of ways, primarily divided between revelation and reason. The Islamic sciences accept and assert that over the millennia, knowledge from revelation, which became embodied over time in religious texts, was made available to man via human agents known as prophets. The sacred text that is extant and considered within the Islamic worldview to be authentic today is the Qur’an. The word Qur’an literally means recital or revelation. Thus, within the Islamic philosophical tradition, scholarship draws from both religious texts and systematic study in the form of science and scholarship (Hashas and Al-Khalib, 2020). This is reinforced by McDonald (2023, p. 4) as he posits that

“knowledge acquired through rational human efforts and through the Qur’an are seen as complementary. While Muslim scientists placed considerable faith in scientific method, they were also aware of its limitations. Even a strong believer in mathematical realism such as al-Biruni argued that the method of inquiry was a function of the nature of investigation: different methods, all

equally valid, were required to answer different types of questions.”

Islamic Science is characterised by a focus on synthesis and holism, and embraces all branches of knowledge, including metaphysics as aspects of a single unity. This is exemplified by Al-Biruni and the number of polymaths within the classical period. Cholidi (2022, p. 129) argues that “the work of a scholar of the calibre and prolificacy of al-Biruni inevitably defies simple classification. He wrote on mineralogy, geography, medicine, astrology, and a whole range of topics, which dealt with the dating of Islamic festivals. Al-Biruni is a specific product of a philosophy of science that integrates metaphysics with physics, does not attribute to either a superior or inferior position, and insists that both are worthy of study and equally valid”. Polymaths such as al-Biruni, al-Jahiz, al-Kindi, Ibn Zuhr, Ibn Rushd, al-Suyuti and thousands of other scholars are not an exception but the general rule in Muslim civilisation. The Islamic civilisation of the classical period was renowned for the number of polymaths it produced. This is a testimony to the homogeneity of Islamic philosophy of science and its emphasis on synthesis, interdisciplinary investigations, and multiplicity of methods.

Eroglu (2023 p.34) further adds that

“ten fundamental Islamic concepts are identified as constituting the framework within which scientific inquiry should be carried out, four standing alone and three opposing pairs: *tawhid* (unity), *khilafa* (trusteeship), *ibada* (worship), *ilm* (knowledge), *halal* (praiseworthy) and *haram* (blameworthy), *adl* (justice) and *zulm* (tyranny), and *istisla* (public interest) and *dhiya* (waste). It is argued that, when translated into values, this system of Islamic concepts embraces the nature of scientific inquiry in its totality; it integrates facts and values and institutionalises a system of knowing that is based on accountability and social responsibility”.

Two complementary aspects of the Islamic sciences have been used to demonstrate that there are other established forms of

gathering knowledge and different methods of research and assessment of truth that have their own claims of legitimacy and exist outside of the dominant western philosophical traditions. This should be considered for the enrichment of current scientific knowledge; it is inappropriate, for example, to reject understanding emerging from such scholarship as pseudo-science or as pre-scientific, because it does not fit the cultural milieu of the dominant system.

The scholarship highlights that co-constitution of European colonial knowledge existence in their particular forms would not exist without the generative role played by local agencies, artefacts, and natural environments. The notion of co-constituted knowledge disrupts binary ontologies and epistemologies as it refers to how the European/colonial and the local made each other possible throughout situated, simultaneous, open-ended, and ultimately contingent and transformative processes (Danielsson, 2020). In this process, colonial education played an instrumental role, promoting and imposing the Eurocentric ways and worldviews while subjugating everything else (Mapaling & Hoelson, 2022; Heleta, 2016). By revisiting colonial conditions that helped bring the category of the local into being, insights are gained from which to develop an alternative scholarly mode of critique that allows us to study more productively the epistemic conditions of peacebuilding inclusivity projects in the present (Danielsson, 2020). Through critical discourse analysis, they explore the orientation of higher education research towards equity and inclusivity and challenge the perception of international higher education research and its distribution through academic journals as value-neutral.

#### **4. Western scholarship as a hegemonic system**

Scholarship, research, and science is an attempt to further human understanding and knowledge by way of systematic study, classification, theory building, justification, and by the application of general principles. The ideological system is the first of two value systems contained in hegemonic systems

(Jacobs Lara, Coral, & Kathryn, 2022). Such scholarship will be designed in such a manner that it weeds out the subjective bias of researchers and their underlying value positions. It seeks to achieve objective knowledge of a subject, which is resilient to scrutiny and falsification. This is done through methods that employ repeatability, validation, justification, robustness and rigour. Therefore, western scholarship is egalitarian, truth-seeking, and provided the claims put forth by researchers are within the accepted norms of scholarship – they have an equal chance of emerging as accepted theories.

The movement to transform and decolonise higher education, a coalition of students, progressive academics, university staff and concerned public must find ways to hold the institutions accountable and maintain the non-violent, intellectual, evidence-based, emotional and popular struggle until Eurocentrism and epistemic violence at universities are dismantled (Chrysostome & Harris, 2021; Heleta, 2016). Against this commitment/challenge, the persistent binaries that mark much of critical peacebuilding scholarship suggest the need for a new mode of doing critique (Danielsson, 2020).

To move beyond this state of critical impasse in relation to inclusivity, without dismissing sensitivity to peacebuilding's colonial and imperialist roots, problematises the emergence of the local-international dichotomy, and acknowledges that whenever and wherever this distinction emerges it is not as a neutral designation but as a move that carries political significance (Danielsson, 2020). By approaching the question of knowledge, epistemic dominance and epistemic differences in peacebuilding inclusivity projects as necessarily situated, practical and achieved rather than given, it becomes possible to disentangle and disrupt the processes whereby certain viewpoints and voices become authoritative in such projects (at the expense of others), which in turn may involve various forms of scholarly knowledge(s) (Danielsson, 2020). The underlying message is an inclusive and uplifting one. In an era of increasing polarisation and identity politics, the findings may positively contribute to the societal conversation and reinforce the conviction that good

things happen when people of different backgrounds, cultures, and ethnicities come together to work towards shared goals and the common good (AlShebli, Rahwan, & Woon, 2018). Discipline may reflect a scientist's substantive knowledge and acquired skills through training, as well as the culture in which collaborative work is carried out. Ethnicity and gender may play a role in shaping scientists' social identities, knowledge, and biases (AlShebli et al., 2018).

Internationals should not impose their knowledge but should support locally formulated knowledge and capacities (Danielsson, 2020). In the case of academic age, inverse homophily was found, i.e. scientists seem to prefer collaborating with individuals from different age groups, a possible reflection of the widely held practice of research students being mentored by, and collaborating with, more senior academics (AlShebli et al., 2018). If universities and academics want to contribute to socio-economic transformation in the country and on the African continent, they have to profoundly change what they teach and how they do it (Shamsaei & Shah, 2017; Heleta, 2016).

Findings across journals and articles demonstrate the absence of a clear definition of the concept of internationalisation, a strong western focus, and often inexplicit recommendations for practical application of research findings (George Mwangi et al., 2018). In contemplating the ecological state of the global knowledge economy, it may be impossible to remain apolitical especially if democratisation of epistemologies is seen as vital to our diversity (Tierney, 2018). The power of coloniality and the great rationality divide affects how science students are culturally constructed and scientifically taught depending on their race and national origin (Ideland, 2018). Accordingly, South African academics who teach about Africa rely primarily on western interpretations of the continent. Knowledge about Africa produced by African academics is primarily ignored (Heleta, 2016). The exclusion of Chinese educational research from western journals seems problematic in this age of globalisation, given China's size and changing role as well

as the disproportionately high number of Chinese students enrolled in western tertiary institutions (Tierney, 2018). Chinese scholars will cite western scholars with significant frequency within both Chinese journals and submissions to western journals, but western scholarly will rarely cite Asian scholars nor submit papers to eastern journals (Tierney, 2018). A rarefied global knowledge network tends to restrict and reduces the intersection across or transaction among or acceptance of diverse epistemologies not aligned with western empiricism and thought (Tierney, 2018). Discipline may reflect a scientist's substantive knowledge and acquired skills through training, and culture in which collaborative work is carried out.

## **5. Methodology**

A qualitative desktop methodological approach was adopted, which reconnoitres an exhaustive scholarship and research. The analysis of secondary scholarship and the use of systems theory underpins the paper. Secondary methods or desktop research was used to conduct the study.

“The purpose of primary research generally should be to fill in gaps in existing knowledge. These gaps cannot be identified without an understanding of the existing knowledge base. The term does not imply anything about the importance of the information, only that it is being used for research beyond the specific informational need that prompted the original gathering of the data. All primary research may ultimately become someone else's secondary source” (Yong, 2022). The integrity of the research is, however, maintained.

## **6. Inclusive scholarship**

Exploring different ways of crafting new approaches to scholarship and research that are less hegemonic and less monopolistic are vital to ensuring that scholarship is more inclusive, tolerant of diversity and difference and hence becomes enriched. Such an undertaking could be pursued, by

adopting the philosophy of science approach – however there are shortcomings to this method.

this chapter therefore proposes that the problem is confronted by focussing on the idea of the hegemonic system. This approach is fortified by that fact that it offers other benefits, for many of the suggestions given here will be applicable to other endeavours to dismantle other hegemonic systems, since the paper posits a method that automatically generalises the problem. This approach may be used as a means to solve many of the seemingly intractable problems faced by humanity at a global level, much of which can be attributed to hegemonic systems at various levels of organisation, which need to be transformed. This is an unintended benefit of it. Consequently, the task becomes one of finding ways to dismantle hegemonic systems, in our case that of the dominant approaches to scholarship and research.

## 7. Dismantling hegemonic systems

A number of ideas are proposed to transform or dismantle hegemonic systems. These are primarily in raw form and require further development if the project is to achieve fruition:

**Play with the boundaries:** Such a prescription is natural to systems scientists. Current boundaries around what is considered rational knowledge, need to be deliberately and consciously made more permeable, so that ideas and signals from both the internal and external environment that may usually considered to be a threat are made to appear friendlier. An example is to stop filtering and to allow the entry of deviant ideas, even ideas that may appear to strike at the very heart of science itself. These ideas, provided they come from an epistemological basis – though it might not confer with that of the hegemonic system ought to be encouraged and nurtured, so that perspectives may be widened and scholarship more robust. One way of playing with the boundaries is to reject the pseudo-science demarcation, and refrain from dismissing academic propositions or assumptions resembling creationism, vitalism, anti-evolution or the

notion of teleology. A similar approach should be taken to parapsychology or spirituality.

**Disband the guile system:** This goes hand in hand with making the ideological system transparent. Science is a human activity aimed at certain ends and that is not value-free. Since it is not value-free, then those values of the ideological system need to be clear and visible and open to interjection and change, while scientific scholarship should not purport to support illusory values. This is supported by Bang & Marin (2015) who outline two ways of disbanding the guile system. Underlying theories of learning and development that structure inequity, expansive views of nature-culture relations, and related possible socio-ecological futures, that drive education will achieve equity in the emerging era of science education. The method of implementation of the above statement paves the way for new and more explicit theories and more equitable education systems. These roots would lead to transparent ideological systems.

**Self-organisation:** Systems under consideration to be complex systems, have the potential for self-organisation. This capability leads to new and different levels of order. Instead of the strong form of control, and indeed coercion, that is an inherent property of the current hegemonic system, focus should change to a mode of operation that relies on parameter setting (Lim & Ikenberry, 2023).

**Amplify the voices of the margin:** The hegemonic system is currently designed to suppress the voices of the margin, since the margin presents a threat that would curtail its imperialistic ambitions. If the voices of the margin are amplified, these voices have a mitigating effect on the hegemonic character of the system. This is similar, but not identical to the concept of polyphony (Cholidi, 2022). In the case of science, a greater diversity of voices need to be brought in and encouraged on the various philosophical traditions – this would include those based on Indian, Chinese, and Islamic civilisations, as well as the diverse indigenous traditions of the world that have been assigned to the margins.

**Become more progressive:** Scholarship needs to take on somewhat of a bolder character, in the sense that young researchers should not be straightjacketed by what their supervisors, advisors, academic sponsors and departments consider to be appropriate scholarship within the narrow hegemonic frame. It is while they are in their prime that they should be encouraged to be more speculative, exploratory and tentatively adventurous in their thinking. Presently, it is only after researchers have succeeded in the hegemonic hierarchy, that such speculative, discovery-driven approaches are tolerated. Young researchers are currently discouraged – whether advertently or inadvertently, covertly or overtly – from going against the mainstream, and when they do, they often find it challenging to get their work to see the light of day. As a result, the current system encourages backward-looking research, centred on the repetition of hegemonic paradigms, as opposed to future-focussed work. This drastically narrows possibilities for ground-breaking work.

**From law to hypotheses:** Building on this, in the current hegemonic system, a researcher is often only able to get work published and thus gain credibility, if the focus of their work is on claims that are closer to theory or law, rather than on as-yet untested hypotheses. This is another sure-fire way of ensuring that scholarship remains staid and impoverished. An ecosystem metaphor of biodiversity is perhaps appropriate here: scholars of the sciences should nurture all kinds of saplings that could grow in a dynamically interacting ecosystem of ideas, hypotheses, theories and laws. Pre-occupation with the validation and justification end of the continuum of current theoretical claims, tends to encourage at the limit what Indian scholar and environmentalist Vandana Shiva terms in a different context as the “mono-culture of the mind” (Stapleton, 2020). A playful, discovery-oriented approach to scholarship can counter this since it allows the generation of theoretical concepts and nurtures what may be seen as ‘half-baked ideas’ into sound hypotheses that may develop over time into more robust theories. this chapter is an example of such a kind of playfulness; the presentation of the

A Clinical Model			
Innovative approaches for inclusive scholarship in system science			
Clinical model for inclusive scholarship			
<b>Key indicator</b>	<b>Existing protocol</b>	<b>Proposed modification</b>	<b>Clinical steps</b>
Western Centric dominant hegemonic systems	Universal acceptance, use and application of western centric Science Systems	Integration of scholarship and scientific studies from a diverse range of society, culture and geographical locations	Establish local, national and continental and inter-continental relationships/networks between scholars  Create national and continental task teams to advance an inclusive system sciences scholarship
Playing with boundaries	The use of western and universal system sciences by scholars who adopt a systems approach that is seen fit for the purposes of development	The incorporation of scholarship and scientific systems from a diverse range of society, culture and geographical locations	Creating diverse and common practices that can be adopted throughout local, national and continental and inter-continental scientific systems that will allow diversification and development for future scholars

<b>Key indicator</b>	<b>Existing protocol</b>	<b>Proposed modification</b>	<b>Clinical steps</b>
Transparency of the ideological system	The use of exiting roadmaps of success on ideological systems that were used by Western scholars and scientific systems	To create a network and board of scholars with a common understanding of the necessity of transparency and its impact on the successful implementation of the ideological system	Develop professional bodies to establish a working group with associates who will function as a means of developing clear and concise information on ideological systems so as to ensure that scholars can access, relate to these systems
Disband the guile system	Dominant Universal acceptance, use and application of Western centric Science Systems	Development of board and accepting mindsets of scholars towards the future development of systems that make room for integration and accepted	Establish forms where scholars can interact, discuss and develop notions of systems sciences so as to disband current guile systems in place

Key indicator	Existing protocol	Proposed modification	Clinical steps
Self-organisation	Personal and opinionated views of scholars in the field of system sciences who expand on research based limited availability of support	The creation of networks, databases and information sharing of scholars of different continents and cultures	The development of databases and networks that scholars can readily have access to. Accessibility to guides and protocols by scholars in the field who have provided clarity and transparency of system sciences
Amplified marginalised voices	Ideological and scientific systems that are not being integrated into new and developed research by scholars due to marginalisation	The development of research teams and networks across national and international boundaries to create an awareness of marginalised voices	Create awareness of the need for inclusivity of practices that are marginalised by integration and adoptability methods established by scholars of local, national and continental and inter-continental bodies
Progressive	Hegemonic system is reconnoitered, and characteristics of related systems cogitated	Establishing local, national and continental and inter-continental relationships/networks between scholars	Corresponding research and development of scholars in research to work together/ as teams to enhance the impact of system sciences on a global scale

nascent idea and concept of a hegemonic scholarship system still requires considerable development and refinement.

## 8. Conclusion

This chapter converges on understanding the concept of systems sciences and hegemonic systems in the course of theoretical debates in education and the impact of a dominant western centric system of scholarship on traditional philosophy. The discoveries as a result of the theoretical analysis indicate that the notion of hegemonic systems is reconnoitered, and characteristics of related systems cogitated. The system is thereafter utilised as an analytical stratagem to scrutinize contemporary scholarship to demonstrate ways in which it has turned out to be undermined and deficient. The proposal of the clinical model assists scholars in future research in developing progressive research that incorporates improved advanced scholarship, representative of a multi-faceted globalised world. Systems scientists need to play with the boundaries around what is considered rational knowledge, allowing for the entry of deviant ideas. This can be done by rejecting pseudo-science demarcation, dismissing academic propositions or assumptions resembling creationism, vitalism, anti-evolution or the notion of teleology, and disbanding the guile system. Self-organisation can lead to new and different levels of order, and amplifying the voices of the margin can help to achieve equity in science education. The voices of the margin should be amplified in science, and a greater diversity of voices should be encouraged. Scholarship should take on a bolder character, and young researchers should be encouraged to be more speculative, exploratory and tentatively adventurous in their thinking.

Young researchers are currently discouraged from going against the mainstream, making it difficult to get their work seen. The current hegemonic system encourages backward-looking research, centred on the repetition of hegemonic paradigms, and narrows possibilities for ground-breaking work. To counter this, scholars of the sciences should

nurture all kinds of saplings that could grow in a dynamically interacting ecosystem of ideas, hypotheses, theories and laws. this chapter is an example of such a kind of playfulness, but the presentation of the nascent idea and concept of a hegemonic scholarship system still requires considerable development and refinement.

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