

 <p>ISSN NO. 2320-5407</p>	<p>Journal Homepage: - www.journalijar.com</p> <h2>INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)</h2> <p>Article DOI:10.21474/IJAR01/4426 DOI URL: http://dx.doi.org/10.21474/IJAR01/4426</p>	 <p>INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR) ISSN 2320-5407 Journal homepage: http://www.journalijar.com Journal DOI:10.21474/IJAR01</p>
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RESEARCH ARTICLE

MULTIPLE PERSPECTIVES- ISSUES OF WORLDVIEWS IN SCIENCES.

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Manuscript Info

Manuscript History

Received: 09 April 2017

Final Accepted: 11 May 2017

Published: June 2017

Key words:-

Worldview, Perspectives

Abstract

Science has always engaged with the worldviews of societies and cultures (Matthews, 2009). The theme is of particular importance at the present time as many national and provincial education authorities are requiring that students learn about the nature of science (NOS) as well as learning science content, knowledge and process skills.

Scientists, Philosophers, Educators and Theologians share the conviction that science education has to promote richer understanding of science and its relation to culture, religion, philosophy and ultimately the worldview of students. The theme for the year 2016 is the year of 'Scientific Issues for development of Nation' which also emphasize on worldviews and the development of scientific temper.

Therefore, here we have tried to address the following questions in our discussion on worldviews in the sciences:

What is a worldview? Does science have a worldview? Are there specific ontological, epistemological and ethical prerequisites for the conduct of science? How can scientific worldviews be reconciled with seemingly discordant religious and cultural worldviews?

Guided by these quests, the present work is an attempt towards understanding worldviews in sciences and how the same can be woven together to have holistic understanding of science, its nature, content processes and the method.

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Worldview is a theory of the world, used for living in the world. A worldview is a mental model of reality- a framework of ideas and attitudes of the world, us and life, a comprehensive system of beliefs- with answers for a wide range of questions. Worldview is considered scientific if it consists strictly of falsifiable components, ideas which can be tested by empirical observation and seeks the highest level of objectivity. According to Kearney's worldview theory, worldview consists of two main components-context and structure our categories of thought. Kearney emphasized that it is not sufficient to know the content of a worldview only, the structure is also very important.

Perspective has a Latin root meaning "look through" or "perceive," and all the meanings of perspective have something to do with looking. If you observe the world from a dog's perspective, you see through the dog's eyes. In drawing, perspective gives your drawing the appearance of depth or distance. If we say someone "has perspective," we mean she has a sensible outlook on life.

Concept of Worldviews in Science:-

It is a concept fundamental to German Philosophy and epistemology and refers to a wide world perception. Additionally, it refers to the framework of ideas and beliefs forming a global description through which an individual, group or culture watches, and interprets the world around it.

Worldview may be understood as a conceptual framework that ties everything together, that allows us to understand society, the world, and our place in it, and that could help us to make the critical decisions which will shape our future. It would synthesize the wisdom gathered in the different scientific disciplines, philosophies and religions. Rather than focusing on small sections of reality, it would provide us with a picture of the whole. In particular, it would help us to understand, and therefore cope with, complexity and change.

Worldview refers to the culturally-dependent, generally subconscious, fundamental organization of the mind. This organization manifests itself as a set of presuppositions or assumptions, which predispose one to feel, think, and act in predictable patterns. Kearney refers to worldview as: 'culturally organized macrothought: those dynamically inter-related basic assumptions of a people that determine much of their behavior and decision making, as well as organizing much of their body of symbolic creations and ethnophilosophy in general (1984, p. 1).

To be rational means to think and act with reason, or in other words, to have an explanation or justification for thought and action. Such explanations and justifications ultimately rest upon one's worldview, one's presuppositions about the world. Or in other words, a worldview inclines one to a particular way of thinking. According to Kearney a world view: consists of basic assumptions and images that provide a more or less coherent, though not necessarily accurate, way of thinking about the world (1984, p. 41).

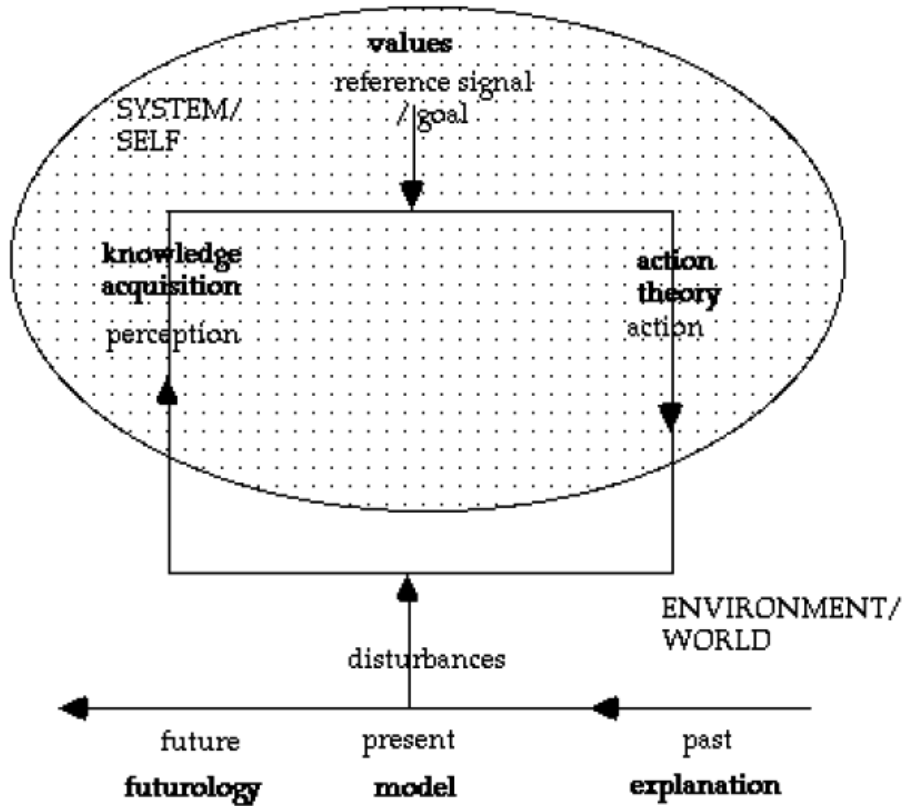
Specifically, a worldview defines the self. It sets the boundaries of whom and what I am. It also defines everything that is not me, including my relationships to the human and non-human environments. It shapes my view of the universe, my conception of time and of space. It influences my norms and values (Kraft, 1978, p. 4). Often one thinks of a worldview as religion or philosophy, for example the Christian worldview or the realist worldview. Religion is indeed an especially powerful formative force on the mind of a growing child, greatly influencing the contours of a child's worldview. But in that there are many other environmental factors that influence a child, religion and philosophy are also part of the specific content of a worldview, thus for example the significant differences and similarities between African and Western Christians. Hiebert (1976) refers to religion and philosophy as the visible expressions of a worldview. In Wallace's descriptive prose: a worldview is not merely a philosophical by-product of each culture, like a shadow, but the very skeleton of concrete cognitive assumptions on which the flesh of customary behavior is hung.

Worldview, accordingly, may be expressed, more or less systematically, in cosmology, philosophy, ethics, religious ritual, scientific belief, and so on, but it is implicit in almost every act (1970, p. 143). According to anthropologists a worldview has five functions (Kraft, 1974). It explains the how and why of things, and why things continue as they do. It validates "goals, institutions, and values of a society and provides them with a means for evaluating all outside influences as well as activities and attitudes within the society" (1974, p. 4). A worldview reinforces people "at points of anxiety or crisis in life providing security and support for the behavior of the group" (1974, p. 5); and both encourages and prescribes behavior. A worldview is an integrator. It allows one to order and systematize sense perceptions. As Kraft writes, This system makes it possible for a person to conceptualize what reality should be like and to understand and interpret all that happens day by day in this framework (1974, p. 5). Finally, there is an adaptive function.

A worldview is "resilient and reconciles differences between the old understandings and the new in order to maintain a state of equilibrium" (1974, p. 5). A worldview helps one maintain a sense of mental order and balance in a world of change via the dialectical interaction between our extant worldview assumptions and environmental changes. Cultural anthropologists study worldviews to learn more about people and their cultures. They want to know why one group acts and thinks this way, while another group acts and thinks a different way. For educators the importance of worldview is identified in two assumptions: that the best immediate understanding of behavior is offered by understanding the thoughts that underlie the behavior, and... Other 4 things being equal, the economy of human thought and the nature of culture are such that cognitive assumptions at work in one area of life, say economic production, will also organize thinking in others, and say ideas about human nature (Kearney, 1984, pp. 3 and 4). In other words, we assume that what we think has a great influence on our actions; and furthermore, that

even very different areas of thought are influenced by what might be called generic, cognitive assumptions. Knowing something about students' worldviews should enable an educator to better understand student attitudes, achievement and behavior in the classroom.

The Belgian philosopher Leo Apostel has devoted his life to the development of such an integrating world view. As he quickly understood, the complexity of this task is too great for one man. Therefore, a major part of Apostel's effort was directed at gathering other people, with different scientific and cultural backgrounds, to collaborate on this task. Only in the last years of his life, after several failed attempts, did he manage to create such an organization: the "Worldviews" group, which includes people from disciplines as diverse as engineering, psychiatry, theology, theoretical physics, sociology and biology.



Source: Leo Apostel's integration, Retrieved from: <http://pespmc1.vub.ac.be/worlview.html>

Evolution of the concept of Worldview:-

Questions about science and worldviews have had a long history. The Galilean revolution, the Darwinian revolution, and the Einsteinian revolution were all associated with profound cultural, religious and philosophical transformations and debates. The European Enlightenment was the first such major impact.

Globalization and the science-based industrialization of many non-Western societies, with their own religious traditions and worldviews, make urgent the understanding of science and its interrelation with worldviews, and for the development of informed and appropriate science education.

Contributors to this anthology include scientists, philosophers, theologians, and educators. They all share the conviction that science education has to promote a richer understanding of science and its relations with culture, religion, philosophy, and ultimately the worldview of students. We can locate transitions in the worldviews in science:

Charles Darwin's *The Origin* provided new worldview in science. It not only talked about the origin of species but also initiated the transformation of modern worldviews and understanding about the place of human beings in the natural world.

Similar worldviews and cultural impact were set in late medieval European society by the publication in 1633 of Galileo's dialogues concerning the Two Chief World Systems followed by fifty years later Newton's Principia Mathematica. These books established the Copernican Heliocentric Model of the solar system which removed humans from the religiously and culturally held prestigious positions. Concomitantly, introduced a lawful and mechanical account of natural processes. Going further back, in the ancient world, the 'science' of the materialists and atomists- Thales, Democritus, Epicurus etc. were in constant struggles with the mentalist, dualist, teleological worldviews of Platonians and Aristotlians.

The mutual interactions of science with the cultural worldviews have been a feature of history of science. Philosophical systems have likewise been compelled to have engagements with science. The towering and influential Kantian programme in metaphysics and epistemology was erected in response to Newton's science. The positivist programme whose foundation had been laid down by Ernst Mach was a philosophical reflection upon the achievements of 200 years of Newtonian science. The engagements of philosophical systems with science are even more important when the systems have had political and institutional embodiments- such as Marxism within Soviet State and Thomism within the Catholic Church.

Understanding the Worldviews Existing in Sciences:-

The normative perspective:-

Frame suggests that in all acts undertaken by humans there is some standard that serves as a guide, and that guide tells people what is the proper subject of inquiry, what actions they should pursue and avoid, what the universe is really like, and how knowledge should be sought. In his view, the marketplace of ideas is full of worldviews competing for the allegiance of each individual, and for some people, final allegiance to a system is due to sense experience, emotions, or political affiliation, while for others it is their particular religious tradition (Judaism, Islam, Buddhism etc.) or secular philosophy (empiricism, rationalism, Marxism, postmodernism etc.) Whatever serves as a person's final authority, functions as his or her normative perspective.

For ex. Christians believe that God has verbally revealed himself to mankind in the Bible for the purpose of providing everything people need for life. In this view, God's inspired word serves as the criteria by which all truth claims are to be checked, and God's word dictates to humanity who he is, the true nature of the world around us, and who people are in relation to God and the world. Thus, the Christian Scriptures serve as the lens through which one ought to see and evaluate everything, and even in knowing the Bible, one knows both the world and himself (and, conversely, in knowing them both one comes to know Scriptures better).

The situational perspective:-

With the situational perspective, it refers to the facts of reality or the objects of knowledge. With this perspective in mind, one must acknowledge the details of history, science, and evidences for various beliefs, and yet, science, history, and the evidences can never be interpreted in a fashion that ignores or sets aside the binding nature of the normative perspective. Viewing things from situational perspective, one looks for how the normative perspective is expressed in everyday life.

Thus, without an understanding of the world, one cannot rightly understand or apply Scripture to his or her life. For example, an argument against abortion might run:

1. Murder is a sin.
2. Abortion is murder.
3. Therefore abortion is a sin.

In Frame's scheme, the first point provides us with a normative command from the Bible, which serves as a timeless moral principle. But in order to arrive at the conclusion one needs to know whether or not abortion is really taking the life of an innocent, unborn person, which requires use of the situational perspective. One must consult medical examinations of the nature of a fetus, the law of biogenesis, and the abortion procedure itself, since without this crucial information one could never know whether the person was faithfully applying God's word in one's life.

The existential perspective:-

With the existential perspective, Frame draws attention back to the person doing the knowing because, he says, individuals bring their personal dispositions, temperaments, biases, presuppositions, and life experiences to every act

of knowing. A problem common to all epistemological endeavors is that if one tries to formulate a true-to-life epistemology, one apparently must examine each and every action performed, but formulating every action into propositions for evaluation is quite tricky. For this reason, the Enlightenment model of epistemology viewed the knowing enterprise as something hampered by human subjectivity and sought an objective mode of knowing that excludes Frame's existential perspective. Frame notes that the search for a purely objective knowledge is not only impossible, but also idolatrous. States Frame:

"Sometimes we dream fondly of a 'purely objective' knowledge of God—a knowledge of God of freed from the limitations of our senses, minds, experiences, preparation, and so forth. But nothing of this sort is possible, and God does not demand that of us. Rather, He condescends to dwell in and with us, as in a temple. He identifies himself in and through our thoughts, ideas, and experiences.

Integration of the perspectives:-

Frame argues that in order to appreciate the richness of the human knowing process, one must see that every instance of knowing involves these three perspectives. Esther Meek, following Frame's model closely, calls these perspectives **the rules, the self, and the world**, and emphasizing the existential perspective, she states, "Knowing is the responsible human struggle to rely on clues to focus on a coherent pattern and submit to its reality". Knowing in this sense is thus the process of integration by which one focuses on a pattern by means of various clues in the world, one's body-sense, and the norms of thinking.

Through this integration process the clues take on greater significance such that they are no longer seemingly disconnected occurrences, but rather meaningful portions that make up a greater reality. Yet, it is claimed, the pattern or integration, once achieved, retroactively throws light on the "clues" that made it up. The particulars retain their meaningfulness, but it is enhanced and transformed. These patterns now shape the knower, because, ideally, they connect her with a reality independent of herself. One comes to see the fullness of the pattern when its truth is lived in (or "inhabited"), thus extending one's self out into the world by means of that truth.

Much of this pattern-making process is inarticulate, but Frame and Meek believe this more-than-words aspect of epistemic acts cannot be ignored because he sees it as crucial in the common, everyday process of knowing.

A Cybernetic Model of a World View:-

The apparently disconnected components of a world view can in fact be understood as part of an encompassing scheme describing the interaction between a system or self and the world or environment. In cybernetics an autonomous system or agent is conceptualized as a control system, which tries to achieve its goals or values by initiating the right actions that compensate for the disturbances produced by the environment. For that, it needs to perceive or get information about the effects of its actions and the effects of the events happening in the world. More specifically, it needs to understand how particular events (past) cause other events (future), that is to say it needs to have a model that allows it to explain and anticipate events.

Conclusion:-

There are multiple worldviews existing in science which has educational imperatives for addressing questions of the relationships in science and cultural worldviews. Worldviews constitute our way of perceiving the reality and therefore it is a modest effort in trying to map those scientific worldviews if could be developed through education may lead to the development of scientific temper.

Since values do not operate in a vacuum, a worldview reflects them as well as the worldview is a consequence of the type of evaluation one holds about the phenomenon. According to Jawahar Lal Nehru, "Science deals with the domain of positive knowledge, but the temper which it should produce go beyond that domain. The ultimate purpose of man may be said to gain knowledge, to realize truth, to appreciate goodness and beauty. The scientific method of objective inquiry is not applicable to all these and much that is vital in life seems to lie beyond its scope. The botanist and zoologist may never experience the charm and beauty of nature; the sociologist may be wholly lacking in love for humanity". The implications of his words are immense. It appears that the discipline which many of us follow do not pursue truly. We do not understand the depth of that and how that relates to society at the macro level. We have just obtained knowledge in a very fragmented and secluded manner without any connectivity.

Researchers reveal that there is a relationship between values and teaching- learning, and worldview, which are positively related to scientific temper. The most significant study in education of today shall be to “operationalize scientific temper in the education system”. From the national core curriculum, exemplar material may be taken up for the development of modules which are problem based, in the nation building context of the struggle for India’s independence. Problem solving can be the approach for the students and specific problems may provide the subject on which a design of operationalization may be developed.

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