

Logic of Pedagogy: Kantian Understanding

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ABSTRACT

In the contemporary educational dialogue, education as a process of humanization is a process of Critical Conscientization. It is a process by which human beings become fully aware that “man as being exists in and with the world.” this awareness enables them to conduct a critical analysis of that reality, thus recognizing and creating the conditions to act upon and transform that reality. Education as Critical Conscientization is a continual process of Critical reflection and action, ever unfolding through revolutionary action. Education is an endeavor to liberate; a goal that can be achieved only if and when it engages individuals in the process and act of creating knowledge through dialogical relationship. This requires continual critical investigation of the world, perception of the processes that define it, recognition of the ideas that give character to it ; construe their conceptualization in understanding them, knowing them and thus knowing their influence on the dynamics of the world. “ The various manifestations of consciousness ...are intelligible only by virtue of the conceptual apparatus by which they are articulated.” An educated person... approaches reality from the ‘inside of a way of thought,’ he has grasped the principles for organizing facts and the conceptual schema which gives meaning or coherence to otherwise disjointed knowledge. Initiation into processes of knowledge acquisition is the raison d’etre of Pedagogy. “ Percepts without concepts are blind, concepts without percepts are empty .”

Kant’s Transcendental Schema of Understanding has immense potential for providing insights into what may be called the Logic Of Pedagogy. Teaching is a process of making a presentation of an organized structure of knowledge to facilitate its perception by the learner. The Structure of knowledge has more than one aspect to it, hence it is necessary for a teacher to perceive and present these in a logically systematized sequence of a series of manifold perceptions. When the teacher has to facilitate their perception, she or he has to essentially make a representation of ideas such that the mind of the learner can apprehend their synthesis in an image. The transcendental schema provides an outline of the mode in which these can become perceivable. The transcendental schema of Understanding is a mediating idea between the pure concepts and sense perception. Each category of the schema is an expression of a unique form of unitary synthesis. Through Categories we recognize in a concept that unit which combines the manifold into one representation- the transcendental object. The pedagogical processes need to take cognisance that the transcendental unity of each category of the schema, is a functional unity which manifests itself identically and yet with a difference. This paper is an attempt to identify some of the fundamental pedagogical processes and illustrate how the distinctiveness of each can be highlighted with reference to the categories of Understanding.

In the contemporary educational dialogue, education as a process of humanization is a process of Critical Conscientization. It is a process by which human beings become fully aware that “man as being exists in and with the world;” this awareness enables them to develop an objective distance from reality and to conduct a critical analysis of that reality, thus recognizing and creating the conditions to act upon and transform that reality. Education as Critical Conscientization is a continual process of critical reflection and action, ever unfolding through revolutionary action. Education is an endeavor to liberate; a goal that can be achieved only if and when it engages the individuals in the process and act of creating knowledge through their dialogical relationship. In other words, it is a process of facilitating acquisition of knowledge, which can serve as a premise for Praxis i.e.the dialectic of critical thought and action.

A necessary prerequisite to revolutionary action of ‘denouncing dehumanizing processes’ and ‘upholding positive social actions’ that transform reality is, “honing of critical awareness.” The honing of critical awareness seeks to sharpen the intellect as well as to sensitize the individual to the political hues which impregnate ideas. According to Paulo Friere, to engage critically with “ideas is....to create and recreate them.”(1) This requires continual critical investigation of the world, perception of the processes that define it, recognition of the ideas that give character to it; construe their conceptualization in understanding them, knowing them and thus knowing their influence on the dynamics of the world.

Knowledge consists in justified true beliefs expounded as judgments. The beliefs are the unexamined ideas that individuals tend to acquire from their experiences in the world; they are not knowledge but are necessary prerequisite to knowledge; they are the reflection of the context or the situation of which the individual is a part or aspires to be. They are also a statement of the individual’s perception of how his identity or being is influenced

by this context and the manner in which the individual would hope to transform it. Beliefs need to be examined & justified to establish in the Understanding as knowledge.

This examination of beliefs can only be accomplished by a mind that perceives, understands and interprets ideas with clarity, precision and accuracy. The role of the educator is to initiate, guide and help the learners to become aware of their beliefs, examine them for justification and verify their truthfulness, thus enabling them to achieve the conceptualization of the processes of which they are a part or a witness; culminating in the construction of the knowledge of their world.

II

The context of justification of beliefs leads us to recall Paul Hirst's views on the Nature of Knowledge. He states:

"To acquire knowledge is to become aware of experience as structured, organized and made meaningful in some quite specific way"(2)

Hirst contends that, "the various manifestations of consciousness, in for instance, different sense perceptions, different emotions or different elements of intellectual understanding, are intelligible only by virtue of the conceptual apparatus by which they are articulated."(3) His premise is that "it is by means of symbols, particularly in language that conceptual articulation becomes objectified and thus shared."(4)

It would be worthwhile to take cognizance of some of his other significant assertions:

1. The distinctions between various forms of knowledge will now be based on their particular conceptual, logical and methodological features.(5) For example, with respect to Physical sciences(empirical) Hirst identifies gravity, force, time, substance, cause -effect as some of the key concepts which are investigated or inquired and known by the methods of : observation, control situation and experimentation. According to him their distinctive truth test is the correlation between sense experience and empirical data.

2. In a given form of knowledge, the distinguishing key concepts form a network of possible relationships in which experience can be understood.(6)

3. The form, by virtue of its particular terms and logic, has expressions or statements that in some way or the other are testable against experience, in accordance with particular criteria that are peculiar to the form.(7)

4. The different forms have developed *particular techniques and skills for exploring experience and making of judgments that... require particular training* (of this kind) in distinct world of discourse. ..because *they involve our coming to look at experience in particular ways, that we refer to them as disciplines.*(8)

At this juncture it is also meaningful to recall R.S.Peters who states that Education "consists in initiating others into activities, modes of conduct and thought which have standards written into them by reference to which it is possible to act, think and feel with varying degrees of skill ,relevance and taste."(9). He upholds that **education always entails some kind of intellectual development, "some kind of knowing-that" as well as "knowing – how"; thus highlighting that the content and method of knowing must be in sync;** that the methodology of education must be appropriate to dispositions involved in the kind of initiation described. Furthermore, his contention is that the teacher and the learner both know what they are doing, in a nascent way, and care about it; believe in it. Summing up Peters' ideas, Hamm states, "education is the achievement of a desirable state of mind characterized by knowledge and understanding, in breadth and depth with cognitive perspective and by corresponding appropriate emotions and attitudes, these brought about, deliberately in a manner not to infringe upon the voluntariness and willingness on the part of the learner."(10)

Notably it is *Understanding* that gives depth to the whole enterprise of knowledge acquisition. Peters elaborates, the *educated person is one who sees the "reason why" of things and approaches knowledge from the 'inside of a way of thought*, 'he has grasped the principles for organizing facts and the conceptual schema which gives meaning or coherence to otherwise disjointed perceptions of the outside world. His reference to breadth of knowledge, answers the demand for wholeness in education. Collaboration between breadth and depth, ultimately compliment each other to generate an ability to see connections between different experiences, thus construing one cognitive perspective. Wisdom or ultimate learning lies in the synthesis of various forms of knowledge to perceive how they play a part in a unified, coherent way of life. These premises have immense potential to provide the framework for the platform for practice of education in a formal classroom situation i.e. teaching.

It is befitting at this moment to once again quote Hirst who cautions:

"we have as yet not begun to understand the complex inter-relations of the different forms of knowledge themselves, for they do not only have unique features but common features too, and in addition one discipline often makes extensive use of the achievements of another."(11)

Hirsts' words of wisdom are:

"we must also not forget that the various forms are firmly rooted in that common world of persons and things which we all share, and into this they take back in subtle and simple ways the understanding they have achieved."(12)

III

Education as a reflective practice necessitates that we reflect over our perception of teaching and the method of teaching, it being the actual platform of practice of education. The term **‘teaching’ makes an epistemic reference, i.e.it answers the question ‘taught what?’ and it is pedagogy which has an epistemological reference i.e.it answers the question ‘taught how?’**. Interpreted in the widest sense, the term Pedagogy connotes the “method of teaching.” Pedagogy is always pregnant with immense possibilities of influencing the ‘perception and interpretation of reality’ which gives birth to ideas and judgments that constitute our knowledge. The philosophical bases of pedagogy is constituted by an interplay of premises that are,

1. Ontological—pertaining to the reality of the being, who in the context of education is the learner whose development is the chief concern. Implicit in it is the inquiry about what constitutes his knowledge? What can he know? How can he know?

2. Metaphysical: Pertaining to the entire realm of reality. In addressing the question, what is the real? We are seeking to find out what is there for us to know. This provides the epistemic feature of knowledge. The interplay of the ontological and metaphysical is revealed in the fact that when we raise a question ‘what is real?’- the reply from the different aspects of being is different. For the intellect the real is abstract /mental /ideational, but for the physical the real is concrete and sensory. This automatically leads us to the question: can we know diverse forms of reality by pursuing the same method of inquiry? This constitutes the domain of epistemology.

3. Epistemological: pertains to understanding of what constitutes knowledge. Is all knowledge alike? if yes why? and if no—then how do we know?

The interplay reveals to us about our own being and its relationship with the world. Varied metaphysical –epistemological permutation combinations create and make diverse pedagogical alternatives available to the teacher. Pedagogy has the scope of being objective, organized and scientific in so far as teaching facilitates perception and understanding of reality. However, pedagogy has to be necessarily an art when it engages the learner in the process of interpreting and transforming reality. Herein it has to give the individual the freedom to invest something of his own and relate to the reality that he is seeking to know.

At this juncture it becomes imperative to take cognizance of two premises:

One.) The way in which an idea, a concept or a judgment is perceived and understood, is the way it ought to be taught. Hence initiation into processes of knowledge acquisition is the *raison d’etre* of Pedagogy. It implies that **the logic of the form of knowledge is to be the logic of pedagogy**. In other words, the **nature of the discipline partakes of itself in the pedagogy of the discipline**.

Two) Knowledge presupposes the mind. Whatever is perceived or experienced must be thought, understood or conceived by Understanding; from it arise concepts. Thus **some of the intellectual processes to which a learner must necessarily get initiated, are to be by implication, the integral part of the method of teaching. These very intellectual processes contribute to the construction of knowledge**.

While the first premise is inferred from the nature of the discipline, the second premise is inferred from the fundamental fact that:

“Percepts and concepts constitute the element of all our knowledge. Percepts without concepts are blind, concepts without percepts are empty.”(13)

Thus it is logical to elucidate the intellectual processes of pedagogy with reference to **Understanding**. What follows is an attempt to relate pedagogical processes to the Kantian Schema of Understanding. Butler in his exposition of Kantian philosophy declares

“The point to be made by way of generalization is that in the experience of knowledge and the mind’s relation to its world, the direction of movement is from the mind towards the world, not from the world to the mind.”(14)

“ Kant’s Critique of Pure Reason, in the section entitled ‘Reason in General’ starts with a clear enunciation of the three main compartments in the process of knowledge .”¹⁵ “*Everything in our knowledge starts in our Sensibility, from there flows into the Understanding, and finally enters into our Reason(CPR,A298)*”¹⁶

Kant spoke of **Space and Time as pure perceptions or a priori forms of knowledge. Space is the form of the outer-sense and Time is the form of the inner-sense**. “ Space and Time are not empirical properties associated with the appearance of external things (phenomena) but just ‘ a priori’ intrinsic, structural conditions of our sensibility studied by Kant on Aesthetics.”¹⁷

“The object is not the source of any form,rather it is formalized by intuition”¹⁸ “Intuitions are made by ‘A Priori’ conditions of our sensibility (Time-Space) and ‘a priori’ concepts such as (“ reality”& “ identity”) convert them by means of Judgement into “ empirical concepts.”¹⁹

The perceived objects are the raw material with which the Understanding works. Through sensibility the objects are given to us as manifold sensations. From the pedagogical perspective, enabling learners to become aware of these two ‘senses’ would imply initiating them into taking sharper and more precise

cognizance of the ‘manifold’ sensations and their organization with reference to space and time, thus enabling their recognition as percepts in their sensibility.

Elaborating further on the nature of Understanding as expounded by Kant, Butler states:

“The Understanding with its Categories, has an organizing machinery by which it approaches the world and relates things logically. By the perceptual categories of Space and Time, the Reason approaches its world and brings order to chaotic sensations, unifying them in distinct and definite objects.”(20)

The Mind houses the multitude of perceptions or representations in association. An a priori faculty of Mind enables it to reproduce perceptions, thus facilitating the possibility of representation of manifolds. This is the faculty of Imagination, in its reproductive aspect. The action of this faculty is called “apprehension and its product is an image.” This a priori synthesis in imagination is “sensible and intellectual”. It serves as mediating representation between the sensible appearances and categories of the Mind which are Pure a Priori concepts of Understanding. It is a mediating idea between the pure concepts and sense perception, hence it is called **transcendental schema of understanding. This a priori synthesis in imagination, is the basis of the associability of representations.** The process of perception is thus in turn dependent on conception; affected by the transcendental schema. “Categories provide linking power.i.e...”joining different representations to each other,and comprehending its multiplicity in one act of Knowledge.”(CPR A77-A80)....the intuitions are submitted to knowledge,for the first time,they can be thought of.”²¹ Kant differentiated 12 categories (within the Analytics compartment) that submit the intuitions to qualitative,quantitative,relational and Modal analysis, as they successively appear in the time-space frame .”²² The synthesis of reproduction in imagination seeks its images in concepts in consonance with the following pure time forms:

Principles of Cognition	Categories of Understanding	Categories of Understanding	Categories Of Understanding
Anticipation of Perception	Time Content	Quality	• A : Being in Time
			• Nothing : Not being in time
			• Something : A Certain degree of being in time
Axioms of Intuition	Time Series	Quantity	• One
			• Several
			• All
Analogies of Experience	Time Order	Relation	• Substance Permanence: Of in being real time,abiding while all else changes.
			• Cause and Effect : Real upon which,whenever an experience is posited something else always follows.
			• Reciprocity : Co-existence of the determination of the one substance with those of the other
Postulates of Empirical Thought	Time Comprehension	Modality	• At any Time : The agreement of the synthesis of different representations.With the condition of time in general.
			• At definite Time : Existence in some determinate time.
			• At all Time : Existence of an object at all time.

There are 4 principles of cognition corresponding to the 4 groups of Categories ,these are : (i) Axioms of Intuition corresponding to the qualitative categories, (ii) Anticipations of Perception corresponding to the quantitative category, (iii) Analogies of Experience corresponding to the relational category and lastly Postulates of Empirical Thought which states that intuition should conform to the conditions of the experience,should be real and eventually necessary.”²³

Further on, the final compartment of Reason according to Kant is the “faculty of linking judgements in a synthetic process,”....This attraction for rational synthesis is based on the causal Principles of Reason which ensure correct synthetic activity. These three unconditioned principles are :

- (i) The Principle of Parsimony: entities are not to be multiplied without necessity.
- (ii) The Principle of Variety which states that the diversity of beings should be preserved; and
- (iii) The Principle of Continuity which states that the logical cause- effect continuum cannot be violated.”²⁴

The progressive linkages on the pure concepts of Reason lead to Judgements of Reason. Kant has enunciated three kinds of judgements–

- (i) Categorical Judgment (A is substance of B, there is no difference)
- (ii) Hypothetical Judgment (Is A the cause of B or Vice Versa) and
- (iii) Disjunctive Judgment (A is either A or b).

At each step of Knowledge , judgements are used as premises in a syllogism and conclusions are obtained by reason. These conclusions are then incorporated as premises in a new syllogism.”²⁵ Thus comprehended, these pure concepts of reason are Transcendental Ideas or Ideas of Pure reason.(A 311-312; A 669-B697) These are regulative in nature.” ²⁶.

The Pedagogical Premise

Through Categories we recognize in a concept that unit which combines the manifold (successfully intuited and thereupon also reproduced) into one representation--- the transcendental object.

The transcendental schema of Understanding has immense potential for providing insights into what may be called as the Logic of pedagogy. It requires us to take account of some of the processes which are an integral part of teaching and which may be analyzed with reference to the schema, to arrive at an explicit exposition of their logical necessities. **To begin with teaching is the process of making a presentation of an organized structure of knowledge to facilitate its perception by the learner.** *The structure of knowledge has more than one aspect to it, hence it is necessary for a teacher to perceive and present these in a logical sequence of manifold perceptions. The individual perceptions of this manifold may pertain to space sense or time sense or both. When the teacher has to facilitate their perception she or he has to essentially make a representation of ideas such that the mind of the learner can apprehend their synthesis in an image. The transcendental schema provides an outline of the mode in which these representations can become perceivable. Hence the basic premise of the logic of pedagogy is that the processes of teaching need to be comprehended and designed with reference to this schema such that they facilitate the perception of the phenomena and the comprehension of the concepts that describe and explain them.* At an elementary level, teaching involves the process of **description**. To describe is to convey in words the appearance, nature, attributes etc. of facts, processes or events. This process may be related to the above mentioned categories of time in–quantity, quality as well as to relation. **Description as a pedagogical device takes the form of a narrative that recounts or recalls a series of occurrences when something comes into existence.** It is the basis of engaging learners in the activity of reporting, relating, situating, etc. *For example, the description of a scientific phenomena like , boiling of a liquid, may be represented as a series of descriptions starting with having 100 ml. of tap water at room temperature and next placing it on a flame –for a specific period of time ,let us say 3 minutes and making no significant observation with the naked eye;5 minutes and finding the appearance of small bubbles at the bottom of the container; 7 minutes and the appearance of larger bubbles moving up towards the water surface in a consistent manner; lastly that the size of the bubbles increases and when they reach the surface they release vapor and this continues to occur till such time that there is water in the container and there is flame heating it .The vividness of details is aimed at facilitating active engagement of learner in the perception of the manifold and their synthesis in the process of apprehension of a concept, which in this case is the concept of ‘boiling’.*

The picture presented above is only recognizing and identifying in a sequence the elements that constitute a process, it does not underline the significance of the nature of relationship between water, its quantity, quality; flame –its quality and their effect on the process of boiling. It is mentioned but its significance is not highlighted. If it is stated that when the flame is increased the same water starts to heat faster and boils faster; and if the flame is not introduced then the condition of the water remains unchanged, then the exposition becomes **an explanation**. **It establishes a correlation that qualifies as a cause and effect relationship that establishes a precondition in a framework of understanding.** Herein the occurrence of one idea is established as dependent on the existence of another idea. It may provide the context of situating ideas such as to relate, associate, coordinate, correspond, connect, justify congruence; compare and contrast.

One recognizes that the time order relation of the schema of understanding prepares the ground for achieving the higher order teaching objectives. An individual who has accomplished the ability to draw comparison and establish a contrast, has taken steps towards comprehending time modality as well. The learner can well be engaged in **discerning, distinguishing, differentiating and discriminating**. Particularly fascinating

is the category of time comprehension *modality—at a given time*. It captures the specificity of a process of conceptualization, thus creating a frame for arriving at an understanding of the process of **defining**, individualizing and characterizing. Referring to the concept of heating, boiling and evaporation simultaneously drawing distinction between the three is essentially engaging the learners in capturing three phenomena from one situation on account of the three different modalities of time comprehension. Water that is hot may not be boiling, but water that is boiling is definitely hot. Similarly, the formation of bubbles is indicative of boiling of water however the bursting of these very bubbles and the release of vapors is evaporation. The modality of time comprehension is the foundation for perceiving change, conversion, transformation, metamorphoses and evolution. Needless to say that learners must be participative so as to analyze –discover or discover-analyze and synthesize ideas to be able to intuitively arrive at judgments that are synthetic in character and born of their experiences. The interplay of the categories generates a plethora of intellectual expressions of Understanding that may provide underpinning to the pedagogical operations.

The distinctiveness of pedagogy of each discipline or the form of knowledge may be understood as an expression of uniqueness in what constitutes the manner and nature of generalizations that contribute to its theorization process. The processes of interpretation and extrapolation, enhance the scope of perception by contributing significantly for paradigm shift in the knowledge of the discipline. The pedagogical processes or operations thus need to recognize that the transcendental unity is the functional unity which manifests itself identically and yet with a difference in each of the categories. Each category therefore is an expression of a unique form of unitary synthesis.(27).

Thus, Understanding is also called the ‘act of bringing together in one self-consciousness (Unity of Apperception) the many perceived objects.’ This explains the necessity of categories for the relation of the original apperception (self- consciousness) to all possible experiences .

The schema provides a basis for formatting of ideas but the process in itself is not a rigid one but a dynamic one. It lends itself to a fluid transition of perceived patterns of conceptual framework. It is befitting at this moment to once again quote Hirst who states :

“ We have as yet not begun to understand the complex inter-relations of the different forms of knowledge themselves, for they do not only have unique features but common features too .”(28)

This statement provides the bases for building **trans-disciplinary bridges in our understanding**. The structure of one discipline has many nodal points which allow for establishing intra as well as interdisciplinary conceptual networks. They enable one discipline to make extensive use of the achievements of another. Thus a concept from one discipline serves as a metaphor in another discipline. For e.g., concept of ‘growth’ from biological sciences is one of the most widely used metaphors. Thus an approach to knowledge that becomes successful in one discipline serves as a paradigm of inquiry in others as well. e.g. The Positive Science model is the most widely accepted paradigm of knowledge.

I would like to conclude with Hirst’s words of wisdom, “ we must also not forget that the various forms are firmly rooted in that common world of persons and things which we all share, and into this they take back in subtle and simple ways of understanding they have achieved.” (29)

NOTES:

1. Friere, Paulo. *The Politics of Education: Culture, Power and Liberation*. Massachusetts: Bergin & Garvey Publishers. (1985)
2. Hirst, P.H. *Liberal Education and the Nature of Knowledge* in Dearden, R.F., Hirst, P.H and Peters, R.S. (edited) *Education and Reason*, Routledge & Kegan Paul. pg 11(1975)
3. Ibid pg 10
4. Ibid. pg 10-11
5. Ibid pg 15
6. Ibid
7. Ibid pg 16
8. Ibid
9. Peters, R.S. *Education as Initiation*.
10. Hamm, Cornell. M. *Philosophical Issues in Education*, The Falmer Press. pg 39 (1989)
11. Thilly, Frank. *A History of Philosophy*, New Delhi: Reprint SBW Publishers (1993)
12. Butler, Donald. J. *Four Philosophies and their Practice in Education and Religion*, New York: Harper and Row Publishers (pg 25) 1968
13. Ibid
14. Bali, Mehta Neelam. *Insight into Metaphysical and Epistemological Bases of Pedagogy*, Short Duration Research Project, (Unpublished) ICPR. pp 67-68 (2006)

15. Baquero, Fernando. Imagining Kant's Theory of Scientific Knowledge: Philosophy and Education in Microbiology. *International Microbiology* (2023) 26: pg 447.
<https://doi.org/10.1007/s10123-022-00315-z>
Published Online : 23 Dec 2022
16. Ibid
17. Ibid pg 448
18. Ibid
19. Ibid
20. Bali,Mehta Neelam. Insight into Metaphysical and Epistemological Bases of Pedagogy, Short Duration Research Project,(Unpublished) ICPR,pp 67-68 (2006)
21. Baquero, Fernando. Imagining Kant's Theory of Scientific Knowledge: Philosophy and Education in Microbiology. *International Microbiology* (2023) 26: pg 449
<https://doi.org/10.1007/s10123-022-00315-z>
Published Online : 23 Dec 2022
22. Ibid
23. Ibid pg 452
24. Ibid pg 453
25. Ibid
26. Ibid
27. Bali,Mehta Neelam. Insight into Metaphysical and Epistemological Bases of Pedagogy, Short Duration Research Project,(Unpublished) ICPR,pg 68 (2006)
28. Hirst,P.H. Liberal Education and the Nature of Knowledge in Dearden,R.F.,Hirst,P.H. and Peters,R.S. (edited) *Education and Reason*, Routledge & Kegan Paul. pg 23 (1975)
29. Ibid

REFERENCES

A: BOOKS:

I. Primary Book: 1. Kant,Immanuel. *Critique of Pure Reason*. Translated by Norman Kemp Smith. New York. St. Martin's Press. MacMillan and Co.Ltd. (1956)

II. Secondary Books:

- [1]. Butler,Donald.J. *Four Philosophies and their Practice in Education and Religion*, New York : Harper and Row Publishers (1968)
- [2]. Friere,Paulo. *The Politics of Education : Culture, Power and Liberation*. Massachusetts: Bergin & Garvey Publishers.
- [3]. Hamm,Cornell.M. *Philosophical Issues in Education*,The Falmer Press,pg 39 (1989)
- [4]. Hirst,P.H. *Liberal Education and the Nature of Knowledge in Dearden,R.F., Hirst,P.H. and Peters,R.S. (edited) Education and Reason*, Routledge and Kegan Paul. pg 11 (1975)
- [5]. Thilly ,Frank. *A History of Philosophy*, New Delhi: Reprint SBW Publishers (1993)

Journals:

- [1]. Baquero, Fernando. Imagining Kant's Theory of Scientific Knowledge: Philosophy and Education in Microbiology. *International Microbiology* (2023) 26: 445-457.
<https://doi.org/10.1007/s10123-022-00315-z>
Published Online : 23 Dec 2022
- [2]. Laub,Jochen.mikhail,Thomas. Kant's Lectures on Pedagogy on World Tour. July 2023.<https://www.researchgate.net/publication/372344160>
- [3]. Wells,Richard B. *Principles of Mental Physics*. Ch.5 *The Categories of Understanding*..<https://webpages.uidaho.edu/rwells/techdocs/>

Unpublished Research Report:

- [1]. Bali,Mehta Neelam. Insight into Metaphysical and Epistemological Bases of Pedagogy.Short Duration Research Project,(Unpublished) ICPR pp 67-68 (2006)