
UNIT 1 UNDERSTANDING KNOWLEDGE

Structure

- 1.1 Introduction
- 1.2 Objectives
- 1.3 Concept of Knowledge
 - 1.3.1 Sources of Knowledge
- 1.4 Nature of Knowledge
- 1.5 Knowing and Knowledge
- 1.6 Facets of Knowledge
- 1.7 Role of culture in knowing
- 1.8 Validation of Knowledge
- 1.9 Let Us Sum Up
- 1.10 Unit-End Exercises
- 1.11 Answers to Check Your Progress
- 1.12 Suggested Readings and References

1.1 INTRODUCTION

Knowledge and its transmission is a main concern of education. What aspects of the vast fund of human knowledge are to be selected for transmission and what criteria are to be used for selection of critical issues in curriculum planning? In this context, knowing about the philosophical basis of knowledge and knowing various sources of knowledge and their validity become important.

Philosophy is conceived as critical inquiry, and as a second-order discipline, it is concerned with the claims of various concrete forms of intellectual activity involving Knowledge. It is an activity of analysis, clarification and criticism of concepts. This view of Philosophy has been inspired by the realization that the results of any sort of enquiry are acceptable only in so far as they are publicly testable, reliable and coherent with the rest of public knowledge. Knowledge must never be thought of merely as vast bodies of tested symbolic expressions. These are only the public aspects of the ways in which human experience has come to be shaped. To acquire knowledge is to become aware of experience structured, organized and made meaningful in a specific way.

In this unit, we shall examine human knowledge - its nature, sources and its various kinds. This is the principal task of the branch of philosophy called 'Epistemology'. We shall also analyze the role of culture in knowing. Finally, we will understand how knowledge can be validated?

1.2 OBJECTIVES

After going through the unit, you should be able to:

- explain the concept of knowledge;
- relate 'knowledge' with 'knowing';
- differentiate between A Priori and A Posteriori knowledge;
- analyse the different sources of knowledge;
- discuss the role of culture in knowing; and
- explain the ways of validating the knowledge.

1.3 CONCEPT OF KNOWLEDGE

In the most common understanding, knowledge includes the beliefs about matters of facts (things, objects, events), about relationships between facts, and about principles, laws, theories that are at work in the nature and society. It also represents our understanding about the relationships; the relationship of the knower with the known. In other words, it is the relationship of the subject with the object. Knowledge is the result of knower's active engagement with the object of knowledge. Knowledge and its intensity depend on the relationship between the knower and the known.

Knowledge includes the fact or condition of knowing which is gained through experience or association. It is a fact or condition of being aware of something, the range of one's information or understanding, the circumstance or condition of apprehending truth. You may conclude that it is the sum of what is known i.e. the body of truth, information, and principles acquired by individuals.

Further, knowledge is understood in terms of enlightenment. The Indian philosophy believes it as breaking the veil of ignorance. One is said to have knowledge, when one is aware of the phenomenon and can also state that the awareness is true. In the school context, knowledge is the sum of conceptions, ideas, laws, and propositions established and tested as correct reflections of the phenomenon.

It is also believed that knowledge can't be defined as it is the sum total of many phenomenon and definitions. But, in spite of this, philosophers have made an attempt to define knowledge. Plato has examined three definitions of knowledge which are as under:

- Knowledge is perception or sensation;
- Knowledge is true belief;
- Knowledge is true belief accompanied by a rational ground.

Plato finally called knowledge as 'Justified truth', and Dewey denotes knowledge as 'inference from truth'.

The National Curriculum Framework (2005), while placing the experience of the knower at centre, also defined knowledge. According to it, "Knowledge can be conceived as experience organized through language into patterns of

thought (or structures of concepts), thus creating meaning, which in turn helps us to understand the world we live in. It can also be conceived of as patterns of activity, or physical dexterity with thought, contributing to acting in the world, and the creating and making of things. Human beings over a time have evolved many bodies of knowledge, which include a repertoire of ways of thinking, of feeling and of doing things, and constructing more knowledge (P.25).”

Knowledge as viewed from a social constructivist approach emphasise that individuals and collective groups are continually constructing and reinventing their understanding of themselves and the world around them.

While understanding about knowledge, you might have come across many terms such as information, truth belief and knowledge which may confuse you. You must have a clear understanding about these terms, which are presented as follows:

Information	Belief and Truth
It is raw data; It is discrete; Pre-meaning stage of knowledge; Prerequisite to knowledge; Preliminary level of knowledge; It is about facts of known; Publicly available.	Belief is personal and primarily subjective feeling and expectation in a person, power or other entity, though shared by others; Could be verified or beyond verification;. This includes ‘the’ truth, and everything else we accept as ‘true’ for ourselves from a cognitive point of view. Verified knowledge; Truth is a property of beliefs, and derivatively of sentences which express beliefs.

Knowledge has been classified into different forms based on different conceptualisations. Based on the way, knowledge is obtained; it can be classified under three heads:

(i) **A priori Knowledge:** It is a knowledge whose truth or falsity can be decided before or without recourse to experience (a priori means ‘before’). Knowledge that is A priori has universal validity and once recognized as true (through the use of pure reason) does not require any further evidence.

“*All bachelors are unmarried*” is A priori knowledge, you need not have experienced the unmarried status but you have this knowledge.

(ii) **A Posteriori Knowledge:** This knowledge based upon observation and experience and it stresses on accurate observation and exact description. The propositions that fall under this category can be looked from the point of view of whether they contain any factual content and from the standpoint of the criteria employed for deciding their truth or falsity. For example, we have propositions like:

- **Ice melts.**
- **Snow is white.**
- **Metals conduct heat and electricity.**

These propositions give us factual information whose truth or falsity can be decided only through observation and verification.

(iii) **Experienced Knowledge:** This form of knowledge is always tentative and cannot exist prior to experience or be concluded from observation. It must be experienced to have value.

1.3.1 Sources of Knowledge

Before you understand the process of constructing the knowledge, it is important to find out the sources of knowledge. Let us discuss them:

A) Knowledge through Sense Experience

We can know many things about the external world, and their characteristics through our senses i.e., by seeing, smelling, touching, tasting and hearing. But we can commit mistake while perceiving things around us through our senses. For example, we may mistake a rope for a snake which is known as perceptual error. Here, it is not our senses that have deceived us but the error in the judgement. When we make a perceptual error owing to incomplete or fragmentary sense experience, it is always further sense experiences that lead us to discover our error. For example, one can get closer and confirm whether it is a rope or a snake. Thus, one can get the knowledge about the external world through external senses.

There are also 'internal senses', acquainting us with our own internal states (feelings, attitudes moods, pains and pleasures), as well as our own mental operations such as thinking, believing and wondering. In these cases, sense-organs are not involved in knowing; nevertheless, on the basis of certain experiences one may state certain propositions like "I am having a headache", "I feel sad"; "I feel ill" and so on. In all these cases the fact that we are having the experience in question is the only guarantee we have or need for the truth of the proposition. In general, feelings are occurrent states, and their occurrence warrants one to say that he or she has a headache, or feels sad or ill.

The words that can be used to describe people's 'inner states' or 'modes and emotions' are 'dispositional words'. For example, "I am in an irritable mood" means that if someone were to annoy me, I would be irritated more quickly than usual. It is important to make a distinction between occurrent and dispositional state in order to understand knowledge through internal senses. A seed having a potency to grow into a plant, but kept in a jar is said to be dispositional; when it grows into a young plant being provided all favourable conditions, then it is said to be in an occurrent state. Thus we have the knowledge of our inner states of mind which can be occurrent in a situation or dispositional (having the potency or properties) to be something given a chance.

b) Knowledge through Reason

This type of knowledge is arrived at by means of reasoning, for example $2+2=4$. There are two types of reasoning which serve as the source of knowledge : deductive and inductive, let us understand them.

In a deductive reasoning, the conclusion logically follows from the premises. If the premises are true, the conclusion that follows must be true. For example,

- *If it is raining, the streets will be wet.*
- *It is raining.*
- *Therefore, the streets will be wet.*

The above example represents a valid argument. If one accepts the premises, one must also accept the conclusion - conclusion follows from the premises, it is important to distinguish validity from truth. In a valid argument, the premises need not be true; it is only required that the conclusion follow logically from the premises. For example,

- *All cows are green.*
- *She is a cow.*
- *Therefore, she is green.*

In this example, the argument is valid, i.e. conclusion follows from the premises. But the premises are not true. Therefore, the conclusion arrived at is also not true.

Sometimes, the premises may be true, but there may not be valid arguments. For example,

- *India is a democratic country.*
- *2 plus 2 equals 4.*
- *Therefore, he is-driving the car.*

In the above example, the conclusion does not follow from the premises, although all premises happen to be true.

Hence, you can say that in order to know that a conclusion is true, we have to know that the premises are true and the argument is valid i.e. the conclusion follows logically from the premises.

In inductive reasoning, the premises provide evidences for the conclusion - but not complete evidence. The conclusion is not certain but only probable to a certain degree. For example,

- *Crow 1 is black.*
- *Crow 2 is black.*
- *Crow 3 is black, (and so on for 10,000 crows or more than that)*
- *Therefore, all crows are black. Similarly,*

Here, though 10,000 premises where crow being black are true, the conclusion is not established. It is always possible; the next crow, which we may come across, might be white. In inductive reasoning, truth is established based on earlier evidences for something, which is not observed. In an inductive argument, we rely on certain laws of nature, which are formulated based on certain recurring uniformities in the course of our experience. For example,

- *Green plants prepare their own food.*
- *Water vapourises on heating.*
- *Metals expand when heated.*

There are countless uniformities that are quite familiar in our experience, and on the basis of them we construct inductive arguments. In an inductive reasoning, the conclusion is not certain but only probable.

c) Authority

It is not a primary source of knowledge where one experiences knowledge through one’s own reasoning or sense experiences. We accept certain things as true on the basis of authority. Following precautions have to be observed in the case of knowledge coming from authority:

- The person must really be an authority, one who is a specialist in his field of knowledge.
- Whenever one accepts another person’s statement on authority, he should be able to find out for himself or verify the knowledge. For example, we can empirically check the truth of Einstein’s theory of relativity, though it would take years of special training and experimentation.
- The authority should be able to provide evidential proof for the knowledge he possesses and present a logical explain
- The knowledge claimed by the authority should have acceptance by the other experts in that area.

d) Intuition

It is a certain kind of experience when a conviction of certainty comes upon us quite suddenly like a flash. Intuitions sometimes conflict. For example, two people can intuit about tomorrow’s weather in different ways. How do we decide which of them is true in that case? If ‘X’ asserts that it would rain tomorrow and Y asserts that it will not, we can wait for tomorrow to find out which of the claims is true. But this we do through sense experience (seeing it rain), not by intuition. Intuition itself provides no way of deciding which of two conflicting intuitions is correct.

Knowing by intuition does not really explain “knowing how”. It tells us nothing about the validating procedure. We have examples from history of scientific investigations (Archimedes principle) and mathematical discoveries where the knowledge was discovered through intuition and proved to be valid also. One can argue here saying, the knowledge was not arrived at as through a flash of thought without certain amount of presuppositions. The problem was contemplated upon for a long period in search of a solution in cases where the scientists were supposed to have intuited. In the process, the scientist must have intuited the solution, which was explained later with sufficient grounds of evidence and reasoning. However, this does not guarantee that every time the scientist intuited, it had carried a valid piece of knowledge.

e) Revelation

This source has the same problem as intuition. Sometimes one claims to know something by means of revelation. For example, “It was revealed to me in a dream” (or a vision). What if one person had a vision that told him one thing, and another person had a vision that told him the opposite? The fact that the person had a dream or a vision, does not show that its message is true or can be trusted. If what it says is true, its truth can be discovered only by other means.

f) Faith

This source of knowledge overlaps the previous one having the same problems. "I know this through faith"; "I have faith in it, so it must be true"; "I believe it through faith, and this faith gives me knowledge". The same difficulty that plagued the claims to knowledge by intuition and revelation occurs here. People have faith in different things and the things they claim to know by means of faith often conflict with one another. Faith is a firm belief in something for which there is no evidence. It is an attitude of belief in something in the absence of evidence. What feeling or attitude one has towards the belief, and whether that belief is true, are two very different things. So it cannot be a valid source of knowledge.

Check Your Progress

- Notes : a) Write your answers in the space given below.
- b) Compare your answers with those given at the end of the unit.

1. Define Knowledge in your own words.

2. Differentiate between A Priori and A Posteriori knowledge.

3. Explain reason as a source of knowledge.

1.4 NATURE OF KNOWLEDGE

In this section, we will try to understand the characteristics of knowledge, which will help you to understand its nature.

(i) Abstract nature of Knowledge

Till now, you might have understood that knowledge is shared understanding; be it justified truth or agreement between two ideas. This attributes to the abstract nature of knowledge.

(ii) Social nature of Knowledge

Knowledge is socially shared understanding, as it is developed through collective pursuit of the community members of the society. Individuals acquire a great deal of knowledge from their own experience; simultaneously they build up the knowledge through association with fellow humans. Therefore, the knowledge is acquired and built up only in society, and its roots lies in the social activities of man. Hence, knowledge is essentially social in character.

(iii) Knowledge is Cumulative

Knowledge is cumulative in nature because it is socially preserved and transmitted from one generation to the future generations. It is continuous to grow and develop in generations with the help of new understanding of reality, knowledge of the reality. In this way, incomplete understanding moves towards complete understanding of the reality. Knowledge grows through a process of not only adding to but also perfecting and correcting the already existing body of knowledge.

(iv) Knowledge is Both Limited and Limitless

The cumulative character of knowledge also informs us both limit and limitless nature of knowledge. At any particular stage in the development of humanity, knowledge comes up against limits set by the limited character of available experience and by the existing means in obtaining knowledge. Therefore, knowledge is always limited, and is at the same time limitless. In other words, the known is always bounded by the unknown but not the unknowable.

(v) Knowledge is Perspectival

Knowledge does not simply 'explain' the objective reality hanging 'out there'; it constructs the reality within the limits set by experience. It is not simply explanatory in character; rather, it is interpretative in character and nature. It is interpreted in a social context. This inherent character of interpretiveness of knowledge makes it perspectival rather than simply perceptual. Knowledge develops perspectives among knowers.

1.5 KNOWING AND KNOWLEDGE

Epistemology is one of the branches of philosophy, which is concerned with the theory of knowledge. It solves two fundamental problems of knowledge—origin of knowledge and validation of knowledge. According to Friere, the cycle of knowing has two important moments which are dialectically related. The first moment is, *moment of production of new knowledge and the other is when the produced knowledge is known to the knower*. Often, the teachers dichotomize these two moments, i.e we make them separate. As a result, the learners are only expected to memorise what teacher says. Consequently, the act of knowledge is reduced to transference of knowledge.

The discussion on origin of knowledge focuses on the relative roles of knower and the known in the making of knowledge. During the process, it generates a wealth of knowledge in both ways and forms of knowing and knowledge. In order to know the origin of knowledge, it is required to focus on process of how we come to know. Process of coming to know begins with knower's (the subject) engagement with to be known (the object). The knower's engagement and relationship begins with his/her contact with to be known. The contact takes place through senses in a context – physical, biological, socio-cultural and others. In this context, the knower own initiatives for seeking knowledge employing different ways assume significance.

As described earlier, knowing is both a process and a product. As a process, it refers to the method of coming to know the phenomenon. Knowledge, as

a product, is resultant of knowing—the process. Knowing happens through perception, reason, and emotion; and codification is done in the language. Similarly, there are means or source of every way of knowing. These sources are the knower’s senses and mind.

Check Your Progress

- Notes :** a) Write your answers in the space given below.
 b) Compare your answers with those given at the end of the unit.

4. Explain the social nature of knowledge.

5. Highlight the relationship between knower and to be known(object) in the process of knowing.

1.6 FACETS OF KNOWLEDGE

There are many facets of knowledge local and universal, concrete and abstract, theoretical and practical, contextual and textual, school and out of school. It is important to have clarity on each facet, let us understand them in this section:

(i) Abstract Vs. Concrete knowledge

Abstract terms refer to ideas or concepts; they have no physical referents, while Concrete terms refer to objects or events that are available to the senses. This asymmetry between concrete and abstract words has been explained by Paivio (1971, 1986) with the Dual Code theory. According to Paivio, words referring to concrete referents are accessed more easily than those referring to abstract referents because the information they convey rests on both a verbal and an imagery code, while that conveyed by abstract words rests only on the verbal code.

Abstract knowledge is about things that are removed from the facts of the “here and now”, and from specific examples of the things or concepts being thought about. Concrete knowledge does not have any depth; it just refers to thinking in the periphery. Hence, Concrete knowledge is just regarding the facts and only has a generalized concept for all things. On the other hand, abstract knowledge requires deep learning and goes beyond the facts.

For gaining the abstract knowledge, mental processes are involved, whereas no such effort is involved in concrete knowledge. Therefore, a person with concrete knowledge does not think beyond the facts and do not have the ability to think beyond a certain limit.

(ii) Theoretical vs. Practical Knowledge

Theoretical knowledge allows you to learn through the experience of others and often leads to a deeper understanding of a context. It helps to understand the concept in its context and thus teaches you to reason and question why. With the help of this knowledge, it is possible to understand the intricacies of a theory and how it can then be applied practically.

For attaining practical knowledge, a deeper understanding of a concept is achieved by doing the act on your own i.e. through personal experience. In other words, you may say that practical knowledge is gained through doing things; it is very much based on real-life endeavors and tasks.

(ii) Universal Knowledge Vs. Local Knowledge

Universal knowledge contains the characteristic of all skills, branches of learning, etc. adapted or adjustable to meet varied requirements of all. You may say that it is a trait, characteristic, or property, as distinguished from a particular individual or event that can be possessed in common.

Thus, Universal knowledge is that which is known to be true everywhere in the Universe and all of the time. Physics and Maths are the two primary fields of study related to this type of knowledge. It doesn't matter where you are or what your situation you can rely on mathematics to remain stable. Equalities will always be equal. All of the functions of mathematics remain constant all the time and they can be used for a great many or all kinds, forms, sizes, etc, intended to be used, or understood by all.

Contrary to Universal knowledge, local knowledge does not embrace many or all skills, branches of learning, etc. It is not adapted or adjustable to meet varied requirements of the universe. Thus, it does not affect, concern, or involve all and is not used or understood by all.

Local knowledge is not experienced by everyone or available for everyone existing or true at all times or in all places without limit or exception. Local knowledge is a collection of facts and relates to the entire system of concepts, beliefs and perceptions that people hold about the world around them. This includes the way people observe and measure their surroundings, how they solve problems and validate new information. It includes the processes whereby knowledge is generated, stored, applied and transmitted to others.

Local knowledge is the knowledge that people in a given community have developed over time, and continue to develop. It is:

- based on experience
- often tested over centuries of use
- adapted to the local culture and environment
- embedded in community practices, institutions, relationships and rituals
- held by individuals or communities
- dynamic and changing

(iv) School-knowledge and Non School-knowledge

School knowledge includes a hierarchically structured, chronologically graded 'education system', running from primary school through the university. And, it includes general academic subjects and a variety of specialized subjects which help the learners to get technical and professional training.

You may say that thus, school-knowledge describes the learning of academic facts and concepts through a formal curriculum. School knowledge includes learning activities that are voluntary and self-directed, life-long, and motivated mainly by curiosity, exploration, manipulation, fantasy, task completion, and social interaction.

School knowledge is organized knowledge guided by a formal curriculum, leads to a formally recognized credential such as a high school completion diploma or a degree, and is often guided and corresponds to a systematic, organized education model, structured and administered according to a given set of laws and norms, presenting a rather rigid curriculum as regards objectives, content and methodology.

Out-of-school-knowledge includes that knowledge which operates before and after school, on weekends and holidays. This kind of knowledge helps in developing and nurturing the talents, in improving the academic performance and provides opportunities to form bonds with adults and older youth who are positive role models. This knowledge includes a wide array of models and approaches. Some are focused exclusively on boosting academic achievement through special courses, tutoring and homework help. Others are specifically focused on providing cultural enrichment in the visual, performing and culinary arts; recreational activities and athletics; or leadership training and community service. It corresponds to the education process normally adopted by our schools and universities. Out-of-school setting and can be linear or non-linear and often is self-paced and visual- or object-oriented. The outcomes of out-of-school-knowledge learning experiences in science, mathematics, and technology include a sense of fun and wonder in addition to a better understanding of concepts, topics, processes of thinking in scientific and technical disciplines, and an increased knowledge about career opportunities in these fields.

Acquiring Out of School knowledge *is* truly lifelong process whereby every individual acquire attitudes, values, skills and knowledge from daily experience and the educative influences and resources in his or her environment – from family and neighbours, from work and play, from the market place, the library and the mass media.

1.7 ROLE OF CULTURE IN KNOWING

The cognitive view of learning highlight that learning is context-dependent – that is, 'situated' – and that new knowledge can only be taken in when connected to existing knowledge structures. This implies that during the process of learning, learners make connections and reorganise knowledge and to develop new patterns and integrated wholes. Thus, learners learn by relating new experiences to what they already know. These new meanings which they develop during the process of learning, are involves making new meanings which are generally expressed through language.

In this way learning, language, meaning and thinking are closely related. Within this perspective, beyond the accumulation and restructuring of information, developing knowledge involves developing processes of self-monitoring and awareness that we refer to as metacognition. Sociocultural theories consider the relationship between thinking and the social, cultural, historical and institutional context in which it occurs.

Thus, in any type of learning context, Language becomes integral that it is the major means by which we make and share meanings with ourselves and with others, and by which we negotiate social relationships and social values. Thus, language becomes one of the means of Knowing, apart from the above mentioned sources/means of knowing. Both the learner's culture and the culture in which meaning is created or communicated have an influence on the ways in which possible meanings are understood. Since, language is a part of the culture or the social context into which a child is born, acts, in more fundamental ways, as the means of knowing.

It is language that makes it possible for an individual to objectify and conceptualise themselves in the world – to give names to experiences, and make sense of the environment, objects, experiences, events and interactions. In short, language is central to the process of conceiving meaning, which is integral to learning.

If you ask your learners about their conceptual understandings about the same object, event or phenomena, you will find variations. This difference in the understanding of the concepts can be attributed to the process of knowing, which is a meaning making process and the meanings to the concepts are provided by the language of the society and the cultural context. Thus, it is through use of language in our interactions with others help that help us learn ways of being in the world. Thus, language helps critically in shaping our knowledge. Construction of social meanings also involves intersubjectivity among individuals and organisations. Social meanings and knowledge are shaped and evolved through negotiation within the communicating group and personal meanings are shaped through these experiences are affected by the intersubjectivity of the community to which the people belong.

Thus, Knowledge as viewed from a social constructivist approach emphasises that individuals and collective groups are continually construct and reinvent their understanding of themselves and the world around them (Jacobs, 2002). Individuals are socialised into a system of beliefs, norms of behaviour and institutions. The influence of the social constructivist's view of knowledge implies that knowledge is a human product, and that it is socially and culturally constructed (Kothari, 2001, p. 148). It points to the notion that individuals create meaning through their interactions with each other and with the environment they live in.

Thus, the very process of experiencing reality is facilitated by the cultural tools and culture acts as means of knowing and knowledge. This is also true in the case of school knowledge. The nature of knowledge provided in schools is textual; which is a representation of our understanding about the world in words. It is nothing but what we call conceptual knowledge. In conceptual knowledge, words play vital role in understanding abstract meaning of concrete. In fact, says Nathaniel Branden (1971), "Words, enable man to deal with such broad, complex phenomena as 'matter', 'energy', 'freedom', 'justice' which no mind could grasp or hold if it had to visualise all the perceptual concretes these

concepts designate.” Hence, by means of words, we can express general conclusions about things and their properties, and about how they are to be used.

From the discussion above, it is clear that the social and cultural factors in knowing and construction of knowledge. Thus the diverse cultural understanding and experiences that students bring are highly influential and need to be taken into account, while you teach in classroom.

Check Your Progress

- Notes :** a) Write your answers in the space given below.
 b) Compare your answers with those given at the end of the unit.

6) Differentiate between abstract and concrete knowledge.

7) Why acquisition of out of school knowledge is lifelong learning process?

8) Explain the importance of language in knowing.

1.8 VALIDATION OF KNOWLEDGE

We have seen that knowledge is obtained through sense experiences, reasoning, authority and other sources. How do we confirm that the knowledge obtained through these sources is valid?

(i) Verification

Can a statement be verified? Can every statement stating knowledge be verified? What is wanted is a rule or principle which will tell us what sorts of statements have or do not have empirical content, for we cannot examine every individual statement. It is easy to verify statements like “this pot of water will boil at 100 degrees centigrade”, since it has empirical content. We can find out whether the statement is true or false by taking the pot of water, heating it and measuring its temperature when it boils.

How about statements like two plus two equals to four? It has no empirical content. But this is an analytical statement and its truth can be shown by purely formal methods. Not all statements are so straightforward as the above empirical statement. Consider statements like “all water is composed of hydrogen and oxygen”; “Saturn is made of green cheese. In the first case, how could we analyse all the water there is to see if it is composed of H₂ O? In the second case, we cannot go to Saturn to look or taste.

To verify a proposition is to make such observations, which would entitle us to conclude definitely that the p is true or false. To confirm it is to make one or more observations that would increase or decrease the probability of its truth or falsity without definitely establishing it either way. If 50 marbles out of 100 are found to be black, we have only confirmed but not verified the proposition that all the marbles in the bag are black. It is not verified until one has examined the entire 100. Verifying and confirming are both things we do, operations we perform. We cannot verify or confirm until we know the meaning of the statement to be verified or confirmed. What the testability criterion prescribes is that we know the meaning only when we know how it would be verified or confirmed, whether any one has actually done so or not. Considering the example of a star which is 1000 light years away, it is empirically impossible for us to discover what is occurring on the surface of that star today, since at the rate of 186,000 miles per second the light leaving the star today will not reach the earth for 1000 years; yet we say that there are spots on the surface of the star today. This is not meaningless.

What is required is logical possibility of verification. So, it is possible to verify a statement for its true knowledge logically, though empirically not possible.

There are certain issues to be considered in verification, which are as follows:

a) When must the verification take place?

This is an important consideration, for no statement about the past or the future can be verified now.

“Julius Caesar was assassinated in 44 BC”.

This statement describes a past event. It is true that we are not in a position to verify it, since it would require our being present at the Roman senate in 44 B.C., which is logically impossible for us to do now. The sentence is about a past event, but any evidences we may find of the statement are present evidences, because nothing will bring us back to the past. The most we can do in the present is to confirm it, that is find some evidence as to whether it is true. The same provision will help us with regard to statements about the future.

“There will be a severe economic depression in the world within the next five years”.

This statement cannot be verified now, though it has a meaning. But it can be verified in the future and this is sufficient to make it meaningful according to the criterion. In general, with statements about the future, we simply wait and observe what happens at the time predicted.

b) By whom must the verification be performed?

The idea of verifiability by only one has been considered somewhat suspect in the fear that it would permit many statements as meaningful, which should not be so permitted. For example,

“I verified the p that infinity is like glass, because I experienced it today”.

But we should keep clearly in mind that any such statement must be about one's feeling - states only, and that it makes no claims to an objective reality apart from that which could be tested by someone else. Concerning one's own experiences (I have a toothache; I feel the pain) it would seem preferable to say that one doesn't need to verify them rather than that one verifies them by introspecting, reassuring oneself that one feel pain and so on. We talk about verification when we are confronted with a statement about something other than our own experiences, when we have to find out through some procedure whether the statement is true.

c) How can statements with an infinite or indefinitely large range ever be verified?

Consider the example, “all crows are black”.

There are not an infinite number of crows, but the class is open-ended. Besides, one could not examine future crows as well as all the crows that lived and died before one's birth.

d) There is a small but peculiar class of statements whose verifiability has a different status in the affirmative than in the negative.

Consider the statement “the earth will continue to exist even after living things no longer exist on it”.

No human being can verify this statement, since no one would be there to verify it. Still we do know what the statement means and can speculate about its truth. We can draw a picture of the earth without living things on it. It is logically impossible to verify this for there would be no one to do the verifying. It is necessary for certain state-of-affairs to occur (present); or to have occurred (past) in order to make a statement true but it is not verifiability. Verifying is something we do, and it requires someone present to do the verifying.

(ii) Confirmability

In view of such difficulties, we speak of confirmability instead of verifiability. For example, one cannot verify that “all crows are black”, but one can confirm it by examining thousands of crows and finding all of them to be black. One cannot verify that some day there will be no life on earth, but one can confirm it now by noting that inanimate objects constantly go on existing even after living things die and infer that when the heat and light of the Sun is exhausted, the earth will become too cold to support life. It is easy to see how we can confirm laws of nature (sun rises in the East; water boils at 212° F and so on) not how we could verify them.

Confirmability also involves some special problems of its own. How can I know that observing that this crow is black is a confirmation of “all crows are black” unless I already know what “all crows are black” means? If one does not already

know what the statement to be confirmed means, how can one exclude any observation that is put forth as confirmation of it? This implies that

- a) One must know whether “p” describes a logically possible situation before one can know whether it is logically possible to test it.

Whether p is logically possible is a priori consideration to whether it is logically possible to test it. One has to know what a sentence means before one knows what observations would verify or confirm it. Knowing what the sentence means is primary, and knowing how to verify it, is a consequence of knowing its meaning.

In conclusion we can say that verifiability or confirmability criterion, as a general criterion of meaning will not suffice,

- i) It will not cover analytic statements, since they are not verified by observation of the world at all.
- ii) It will not cover non-assertive sentences such as question, imperative and exclamation. Since these assert nothing, there is nothing that could be true or false.
- iii) It will not cover statements about one’s own experiences, since these are not verified in any easily intelligible sense of “verified”.
- iv) It will not cover statements such as “this is good” or “this is praiseworthy” which are of an entirely different order. They are value statements.
- v) It will not cover metaphysical statements.

The only area in which verifiability or confirmability is plausible is in reference to empirical statements such as one made in daily life and in science.

(iii) Refutation

Knowledge that is expressed in the form of laws or theories can be refuted on the grounds of incompatibility of an event with the theory. It is easy to obtain confirmation or verification for nearly every theory - if we look for confirmations, confirmations, should count only if they are the result of risky predictions, i.e., to say, if unenlightened by the theory in question. When the event is incompatible with the theory of question, it can be refuted. Confirming evidence should not count except when it is the result of a genuine test of the theory, and this means that it can be presented as a serious but unsuccessful attempt to falsify the theory (in such cases of Corroborating evidence).

Every genuine test of a theory is an attempt to falsify it or to refute it. Testability is falsifiability. But they are degrees of testability. Some theories are; more testable, more exposed to refutation than the others.

In his classic work *Conjectures and Refutations*, Popper uses Marx’s theory of Society and Freud’s theory of human behaviour as outstanding examples of theories, which fail to meet this important criterion. If political event X occurs, (or human behaviour Y is displayed), then Marx (or Freud) provide a ready explanation. If X or Y do not take place, when they were expected to, then (using a different chapter and verse of the relevant text) that can be explained. Such theories are incapable of making definite and therefore, falsifiable, predictions. In attempting to explain everything, -they explain nothing.

But we cannot get conclusive evidence that there are no more dimensions. We can only say that everything we have observed so far can be explained satisfactorily with laws assuming only three spatial dimensions.

If the basic assumption is true, the conclusion that follows through deducibility would also be true. If the assumption is false, or built upon false premises, the conclusion that follows would also be false. However, the rules of deducing a true case from the basic assumption should be valid. There are cases where propositions are true, but it may not be possible to deduce a specific case, as each of the propositions may stand independently as a true state of affair.

The assumption can never be proved complete (e.g. three dimensional world and infinity of observations related to certain natural phenomena).

1.9 LET US SUM UP

Epistemology is that branch of philosophy, which deals with theories, sources, and the validity of knowledge. Knowledge is expressed in the form of propositions. In order to know a proposition is true, one must know the words involved in the propositions and the concepts underlying the words. There are certain requirements for knowing a proposition, that is, a) the p must be true, b) we believe that p is true and c) there is evidence or reason to believe p. Knowledge is categorized broadly into three divisions depending upon the ways it is obtained. They are a) A priori knowledge, b) A posteriori knowledge and c) Experienced knowledge.

Following are the sources of knowing: sense experience, reason, authority, intuition, faith and revelation. Among these, the knowledge through sense experience and reasoning were considered to be the most reliable sources of knowledge.

The knowledge that is accumulated through man's different ways of knowing consists of various concepts and facts, related to physical phenomenon and human been evolved through continuous observation of natural events in life. True knowledge provides for its own interpretation, verification and explanation. The laws and theories provide explanation of occurrences in nature. Explanations form a hierarchy where the facts on the lowest level are explained by theories, and each theory in turn is explained by the theories on a higher level in a logical manner. Verifiability and confirmability criterion is applied to test the knowledge for its validity. Knowledge with its distinctive features of concepts, facts, generalizations, laws and theories get structured in different forms of knowledge (a-priori, a-posteriori and personal knowledge) under different disciplines. This has great implication to curriculum planning and understanding of the methods and domain of a discipline.

1.10 UNIT-END EXERCISES

1. Analyse the secondary school curriculum and identify examples of A Priori knowledge and A Posteriori knowledge.
2. Give some examples from secondary school curriculum where verification, confirmation and refutation can be used to validate knowledge.

1.11 ANSWERS TO CHECK YOUR PROGRESS

1. You are expected to write your understanding about the concept of education.
2. A priori knowledge includes that knowledge whose truth or falsity can be decided before or without recourse to experience whereas A posteriori knowledge is based upon observation and experience and it stresses on accurate observation and exact description.
3. Reason as a source actually helps in generating knowledge through reasoning. It includes both inductive and deductive reasoning.
4. Social nature of Knowledge describes that knowledge is developed through socially shared understanding, as a collective pursuit of the community members of the society.
5. In the process of knowing, the knower's engagement and relationship begins with his/her contact with to be known. The knower makes contact with the object by using her senses for seeking and developing knowledge.
6. Abstract knowledge refers to ideas or concepts which have no physical referents, while Concrete knowledge refers to the knowledge about the objects or events that are available to the senses.
7. It is because this type of knowledge is acquired by an individual from daily experience and the educative influences and resources in his or her environment.
8. Because it is through language individuals make meaning and share meanings with ourselves and with others.

1.12 SUGGESTED READINGS AND REFERECES

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