Knowledge and Curriculum

Dr. Agnes Ronald D’Costa

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PREFACE

The Curriculum Framework for the Two Year B.Ed. Programme, rightly suggested that student-teachers should be encouraged to become reflective practitioners. For this, three interrelated areas were suggested – Perspectives in Education, Curriculum and Pedagogic Studies and Engagement with the Field. One of the courses suggested under Perspectives in Education is ‘Knowledge and Curriculum’. This course aims at introducing students to perspectives in education and focusing on epistemological and social bases of education. The framework notes that this will help prospective teachers to take decisions about and shape educational and pedagogic practice with greater awareness of the theoretical and conceptual underpinnings that inform it.

The National Curriculum Framework for Teacher Education (NCFTE, 2009) elaborated the context, concerns and vision of Teacher Education and underscored that Teacher Education and school education have a symbiotic relationship. Development in both, Teacher Education and School Education will, therefore, reinforce each other and bring about a qualitative change in the educational scenario. To ensure this quality, it is necessary for all teachers to thoroughly examine the concepts of knowledge, curriculum, syllabus and textbooks. After all, curriculum is not something that is ‘handed down to teachers’; rather it is something that is ‘created by teachers’. Mindful endeavours will help teachers understand the curriculum and decide the best means to transact the curriculum.

The present book is a humble effort to help student-teachers and teacher-educators delve into the realms of the epistemological and social bases of education. The book helps to explore various facets related to knowledge, education and curriculum. The contributions of various educational philosophers have been examined from the point of view of their influence on present-day education. Education has witnessed a marked change due to changes in society. The impact of these changes has been analyzed. Appropriate research studies have been taken into consideration and quoted wherever necessary. Concept maps have been included to encapsulate the essence of certain concepts. A special feature of the book is the inclusion of some cases of exemplary education. These examples not only clarify concepts like democratic education and multicultural education, but they also inspire teachers to emulate the efforts of great educationists.

I do hope the book is useful to teacher-educators and student-teachers. Your comments, suggestions and feedback are most welcome as they will help further improvement.

Dr. Agnes D’Costa
Objectives:
1. To enable the students to learn about epistemological bases of knowledge.
2. To enable the students to understand the various concepts and maxims of education.
3. To enable the students to understand the concepts and approaches of curriculum development.
4. To enable the students to understand the bases and determinants of curriculum.
5. To acquaint the students with the curriculum reform in the Indian context

Module 1: Epistemological Bases of Education

Unit 1: Understanding Broad Perspective of Education
(a) Concept of Knowledge:
   (i) Meaning, definition and characteristics,
   (ii) Types of knowledge – philosophical: personal, procedural and propositional
   (iii) Sources of Knowledge – education: situational, conceptual, and strategic
(b) Distinctions between ‘knowledge’ and ‘skill’, ‘teaching’ and ‘training’, ‘knowledge’ and ‘information’, and ‘reason’ and ‘belief’,
(c) Concept of Education – Etymological meaning of Education, Characteristics of Education.

Unit 2: Basis of Modern Child-centered Education
(a) Concept, need and significance of activity, discovery and dialogue in Education.
(b) Activity-based learning – Mahatma Gandhi, Rabindranath Tagore, Discovery learning – John Dewey.
(c) Need and significance of dialogue in education – Plato and Paulo Freire.

Module 2: Social Bases of Education

Unit 3: Social Context of Education
(a) Concept of society, culture and modernity;
(b) Historical changes with respect to education due to industrialization and democracy, leading individual autonomy and reason.
(c) Influence of modern values like equity and equality, individual opportunity and social justice and dignity for educational development of the individual and society w.r.t. Dr Ambedkar (Rodrigues, 2002).

Unit 4: Cultural Context of Education
(a) Concept, need and significance of ‘critical multiculturalism’ and ‘Democratic education’ in Indian education system (Applein & Beane, 2006; Parekh, 2000).
(b) Practices to promote ‘multiculturalism’ and ‘Democratic education’ in school and classroom.
(c) Concepts of nationalism, universalism and secularism and their interrelationship with education, with special reference to educational philosophy of Rabindranath Tagore (2003) and J. Krishnamurti (Krishnamurty, 1992).

**Suggested Assignments**

1. Seminar presentations on the educational contributions of Gandhi/Tagore, Dewey, Plato/Freire and relate its activity, discovery and dialogue with respect to education
2. Assignment – Analysis of news articles to review the practices of modern values like equity and equality, individual opportunity and social justice and dignity for educational development of the individual and society.
3. Scripting and performing a street play to address social issues of education.
4. Digital Presentations – Review the recommendations of National Knowledge Commission of India. Visit education portals of Indian government for education, and study its objectives and recommendations that cater to multiculturalism and democratic education.

**Objectives:**

1. To enable the students to learn about epistemological bases of knowledge
2. To enable the students to understand the various concepts and maxims of education.
3. To enable the students to understand the concepts and approaches of curriculum development.
4. To enable the students to understand the bases and determinants of curriculum.
5. To acquaint the students with the curriculum reform in the Indian context.

**Module 3: Understanding Curriculum and its Development**

**Unit: 5 Curriculum and its Determinants**

(a) Concept of Curriculum and their relationship with the aims of education (Kumar, 2004), Determinants of curriculum, and understanding of hidden and enacted Curriculum.
(b) Role of Nation, State and school in curriculum construction.
(c) Conceptual linkages and distinctions between curriculum framework, curriculum, syllabus and notion of textbooks – Print and digital materials.

**Unit 6: Making of Curriculum**

(a) Translation of curriculum into textbooks.
(b) Role of representation and non-representation of various social groups in curriculum making.
(c) Concerns for curriculum making in context to power embedded in various structures of society and knowledge.

**Module 4: Transaction and Assessment of Curriculum**

**Unit 7: Engaging with the Curriculum**

(a) Critically analyze existing school practices in the light of what is valued and devalued in commonplace rituals of school, its celebrations, and its notions of rules, discipline, or the time-table.
(b) Understanding of hidden curriculum and children’s resilience w.r.t. the above (Unit 7a).
(c) Strategies for making curriculum contextually responsive.
Unit 8: Evaluating Curriculum

(a) Indicators of effective curriculum construction
(b) Evaluation of the effectiveness of curriculum content, existing pedagogies and instructional approaches, teacher training, textbooks and instructional materials.
(c) Agencies of evaluation of curriculum at national/state level – National Ministry of Education, regional education authorities – Functions of NCERT and SCERT.

Suggested Practicum – Any Two

1. Prepare a report on a school visit containing the best practices for linking curriculum with social realities.
2. Prepare a small curriculum for any social group like – Life skill training for street children, Human right education for disabled children.
3. Suggesting activities from performing arts for making curriculum socially responsive.
4. Visit a school and study how the vision and mission of the school are reflected in the programmes of the school.
SYLLABUS OF SHIVAJI UNIVERSITY
Course 5a : Part-I : Knowledge and Curriculum Part-I
Contact Hours : 02

Objectives:
To enable the student-teacher to:
1. understand the nature and importance of education and educational process.
2. understand the concept of child-centred education with reference to the thinkers.
3. understand the need to study education in sociological perspective.
4. understand the education in relation to modern values like equity and equality, social justice and dignity.
5. understand autonomy of Teachers and Learner.
6. understand historical background of individual autonomy.
7. understand role of Teacher’s autonomy in enriching learning situations.
8. understand the concept, need, nature and process of curriculum.
9. understand concept of curriculum and its various dimensions.
10. understand relation between curriculum, syllabus and textbooks.

Unit I: Education and Knowledge
(A) Concept, nature, objective (Post Independence) of education and social need of education.
(B) Education for – Individual development, social change.
(C) Child-centered Education: activity, discovery and dialogue with reference to:
   – Mahatma Gandhi.
   – Ravindranath Tagore.
   – Dewey.
   – Plato.
   – Tarabai Modak/Gijubhai Badheka.
(D) Information, knowledge, belief and truth – concept, Teaching and Training – concept.

Unit II: National Integration and International Understanding
Relation between education and society, education and culture, education and modernization.
(A) Concept and need of nationalism, universalism, secularism and their interrelationship with education, concept of multiculturalism with special reference to Tagore and Krishnamurthi.
(B) Concept of values, education related to modern values, individual opportunity, equity and equality, social justice and dignity with reference to Dr. Ambedkar.
(C) Multiculturalism and democratic education: Concept and their practices in school and classrooms.

Unit III: Autonomy of Teacher and Learner
(A) Individual autonomy: Concept, reason and historical reference.
(B) Individual autonomy: Democracy and Industrialization – concept and relation with education.
(C) Autonomy of Teacher and Learner, Difference between Autonomy and Freedom.
(D) Role of Teachers’ autonomy in enriching learning situations.
(E) Factors affecting teachers’ autonomy.

**Unit IV: Curriculum**

(A) Curriculum: concept, nature and need.
(B) Curriculum and their relationship with the aims of education.
(C) Curriculum: Process of making curriculum, Role of nation, state and class in the development of curriculum.
(D) Types of structure of Curriculum:
   1. Subject-centred.
   2. Completing lineal needs.
   4. Competency.
   5. Behaviouristic.
   6. Constructivist.
(E) Interrelation between Curriculum, syllabus and textbook.

**Course 5b: Knowledge and Curriculum Part-II**

**Objectives:**

To enable the student-teacher to:

1. understand philosophy of education, constitution, Kothari Commission, NCF (2005) and state policy on education 2010.
2. understand national and international awareness through education.
3. realize the contribution of educational thinkers.
4. understand role of state in the curriculum.
5. understand role of hidden curriculum.
6. understand social reconstruction through curriculum.
7. understand the relation of curriculum and school practices.
8. help to analyze the textbook, teachers’ handbook and child-centred literature in reference to curriculum.
9. understand the role of teacher in implementation of curriculum.

**Unit V: Education and Philosophy**

(B) Education for Human Rights, Democratic education, education for social mobility, Education and development.
(C) Difference between information and knowledge, Difference between belief and truth, Difference between knowledge and skills.
Unit VI: Thinkers and Teachers

(A) Contribution of Thinkers in Education with reference to:
   – Mahatma Gandhi
   – Ravindranath Tagore
   – Montessori
   – Plato

(B) Role and skills for Teacher in 21st century.

(C) Changing role of the teacher.

(D) Changing concept of education to related to school, curriculum, learner, teaching and learning.

Unit VII: Curriculum

(A) Role of state in the curriculum.

(B) The Role of hidden curriculum and children resilience.

(C) The relation between powers, ideology and the curriculum.

(D) Introduction to the challenges of 21st century with respect to Indian society – urbanization, privatization and globalization.

Unit VIII: Curriculum and Social Practices

(A) Role of Curriculum at school and class level and concept of hidden Curriculum.

(B) School discipline and rules, school timetable – concept and their interrelation with curriculum.

(C) Analysis of textbook, teacher’s handbook and children’s literature with reference to curriculum.

(D) Role of Teachers in implementation of curriculum
   1. Construction of curriculum objectives in local situations.
   2. Searching references for learning.
   3. Development of learning resources and different learning experiences.
   4. Management of physical facilities.
From 2015, the Two Year B.Ed. programme has been implemented all over the country. The syllabi in most Universities have been drafted according to the Curriculum Framework which has been meticulously drawn by the NCTE. The course ‘Knowledge and Curriculum’ has been introduced to help ‘prospective teachers to take decisions about and shape educational and pedagogic practice with greater awareness of the theoretical and conceptual underpinnings that inform it’. The course will definitely help student-teachers embark on a journey of critical thinking and reflection. I sincerely hope this book facilitates this journey.

For the successful compilation of the book, I have to thank many people. I am grateful to the Management, Principal and staff of Pushpanjali College of Education, Vasai, Maharashtra for their unstinted support. I am grateful to my mentor Dr. Veena Deshmukh for instilling in me a spirit of inquiry and the zest to keep on learning. My husband Ronald, daughter Priya and my sister Tina have always been my strength and inspiration. To them, I will always be indebted. Above all, I acknowledge the grace of God in my this endeavour.

I thank Himalaya Publishing House Pvt. Ltd. for their contribution. I do hope the book will be useful to teacher-educators and student-teachers and promote an understanding of the course.

Dr. Agnes D’Costa
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Chapter : 1

Understanding the Perspectives of Education

Structure:

1.1 Meaning of Knowledge
1.2 Characteristics of Knowledge
1.3 Types of Knowledge (Personal, Propositional and Procedural Knowledge)
1.4 Situational, Conceptual and Strategic Knowledge
1.5 Sources of Knowledge
1.6 Knowledge and Skill
1.7 Teaching and Training
1.8 Knowledge and Information
1.9 Belief and Reason
1.10 Concept of Education: Meaning and Characteristics
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1.11 The Knowledge-Education Connect

Objectives

- To enable students to understand the concept of knowledge
- To enable students to understand various aspects of education

Knowledge is a crucial tool in our lives. We are able to perform various tasks because of the knowledge we possess. Knowledge could mean ‘knowing some facts and information’ or ‘knowing how to do a task’. Knowledge is necessary to take decisions and to solve problems. In fact, knowledge is fundamental to our very existence as human beings.

1.1 MEANING OF KNOWLEDGE

The sum of human understanding, both of material or mental reality, is knowledge. This knowledge could be given (by others, by books or by experience) or it could be constructed in the mind. When we say we know something about a given object or phenomenon, it means there is some kind of relationship between the knower and the known. Knowledge emerges out of an active engagement with an object. For example, when Meena says ‘I know to ride a bicycle’, it means she has the experience of riding a bicycle, she knows about the parts of the bicycle, she knows how to move from one place to another on the bicycle. In Indian tradition, knowledge means transition from ignorance to enlightenment. A verse from the Yajurveda elucidates, ‘Imparting knowledge to the
ignorant, light to the benighted. Rise ye, mortals, like unto the dawn’. In the context of school or institutional education, knowledge refers to concepts, laws, processes and propositions.

In normal conversation, knowledge could mean: (i) knowing the ‘what’ aspect, i.e., knowing facts and information and (ii) knowing the ‘how’ aspect, i.e., possessing the ability to do something. For example, Sameer knows what ‘filtration’ in Science is and he can identify the apparatus used to carry out filtration. He has knowledge about the ‘what’ aspect of filtration. Given a filter paper and a mixture of mud and water, Sameer is able to separate the mud from the water, implies that Sameer knows the ‘how’ aspect of filtration.

Plato defined knowledge as true opinion combined with reason. In his dialogues named Theaetetus, Plato referred to three explanations of knowledge: knowledge is perception or truth, knowledge is true belief, knowledge is a true belief with a rational account.

John Locke refers to knowledge as the perception of agreement or disagreement of two ideas.

Dewey, who was a pragmatist, viewed knowledge as that which can be inferred from evidence.

According to Webster’s Dictionary, knowledge is “the fact or condition of knowing something with familiarity gained through experience or association”.

The tripartite theory says that if you believe something, with justification, and it is true, then you know it; otherwise, you do not. Many others have refuted this theory.

The National Curriculum Framework, 2005 states that “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 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.”

The above extract from NCF 2005 implies that it is important for children to participate in the process of knowledge creation. It is not only the product but also the process involved in knowledge generation that needs our attention. Knowledge is not a finished product that the teacher transfers to the mind of the child. In such a case, the learner is just a passive recipient. It is more important for the learner to be dynamically engaged with the learning situation and thus create knowledge.

1.2 CHARACTERISTICS OF KNOWLEDGE

Knowledge is characterized by some special features.

1. Three Aspects of Knowledge: Knowledge has three main aspects, the knowledge seeker (the consciousness of the participant), the known (the field of study) and the process of knowing which connects the knower and the known. An effective blend of all three aspects leads to knowledge. Very often, education focuses only on the field of study and neglects the position of the knowledge seeker and the process of knowing. This hampers the construction of knowledge.

2. Social Character of Knowledge: Knowledge is a shared product. Interaction of people in the society generates knowledge. It cannot be attributed to a single individual; rather it develops due to the contribution of different people in the society. Even if certain knowledge comes from one person, this person’s previous knowledge is a product of his/her experience with society. Knowledge cannot be generated in vacuum. It is created, sustained and nourished by society. Consider this example. Karl Marx has contributed to Economics through his Theory of Surplus Value. Though this theory may be the contribution of Marx,
yet it must be acknowledged that Marx proposed the theory due to what he observed and experienced in society. His previous understanding of wealth generation, production and the conditions of the working class resulted in this theory.

3. **Cumulative and Non-depleting Character of Knowledge:** Knowledge grows by building on what already exists and hence is cumulative in nature. The knowledge of reality is ever expanding. Discoveries of new facts, changing perceptions and a change in the way we view and understand something leads to expansion of knowledge. Human understanding of the world around us is always in a state of change. For example, in the past, it was believed that the Sun moves around the Earth. As science developed, this knowledge changed and we accepted that the Sun is the centre of the solar system. Old knowledge gets enhanced and in some cases, it gets replaced. Knowledge can never be stagnant. This leads to knowledge expansion and in the past few decades, we are experiencing knowledge explosion. Knowledge cannot be depleted. If one uses a natural resource, it may be exhausted. But if we use knowledge or share knowledge, it does not get depleted. Existing knowledge gets refined but one can never claim that knowledge in a field has been perfected. For example, man’s knowledge about the human brain has seen a lot of development, yet we cannot claim that we know everything about how the brain functions. There is still scope for our expansion of knowledge about the brain.

4. **Knowledge Develops Perspectives:** Knowledge is not just explanatory; it is also interpretative in nature. Depending upon the kind of exposure the knowledge seeker has, knowledge tends to construct reality for the knowledge seeker. Knowledge is interpreted in the social context and hence is said to be perspective generating. For example, if a student gains knowledge about Mahatma Gandhi and his work, he is not just gathering facts about Gandhiji’s work; he is also forming some perspectives based on the knowledge.

5. **Knowledge is Transferable:** Knowledge can move from place to place; explicit knowledge (in form of documents, books etc) in particular, can easily be distributed via networks to many people. We accept that knowledge is transferred from teacher to student, from one generation to another or from author to reader.

6. **Knowledge can be Categorized:** According to NCF 2005, knowledge can be categorized based on distinct kinds of concepts and meanings involved and processes of validation and justification. Thus, we have Social Sciences, Mathematics, Natural Sciences, Business Studies, Humanities and Arts as different areas of knowledge. Each involves its own kind of ‘critical thinking’, its own way of verifying and authenticating knowledge, and its own kind of creativity. Each category provides a lens to view the world, understand the world and engage and act in the world. For example, our knowledge of Mathematics helps us to appreciate the aesthetics in architecture, it helps to understand money transactions and it helps us to carry out basic calculations. This is because Mathematics as a category of knowledge has its own concepts and meanings.

### 1.3 TYPES OF KNOWLEDGE (PERSONAL, PROPOSITIONAL AND PROCEDURAL KNOWLEDGE)

Philosophers divide knowledge into three types which are explained below:
**Personal Knowledge**: Personal Knowledge refers to knowledge by acquaintance. For example, a person understands the term ‘fear’ or we can say he has knowledge of the term ‘fear’ because she/he has experienced fear. If someone says “I know Anisha”, it means that the person making the claim has met Anisha or had some experience or contact with Anisha. Personal knowledge will involve having some kind of propositional knowledge as well. Higgs and Titchen define Personal Knowledge as the result of the individual’s personal experience and reflections on these experiences.

**Procedural Knowledge**: Procedural Knowledge also called as imperative knowledge is the knowledge required to perform a task. For example, in order to drive a car, we need to have procedural knowledge in order to actually perform the task. A person may explain the accurate procedure of driving a car, but if she/he cannot actually drive one, she/he lacks procedural knowledge. The person has propositional knowledge, but no procedural knowledge. If one has carefully watched a chef make *roomali rotis*, one may be able to tell the exact ingredients and the right procedure. This is propositional knowledge. But if the person is unable to make the *roomali roti*, then she/he has no procedural knowledge. In real life, we need procedural knowledge or else we will not be able to perform many tasks. Procedural knowledge, thus, is a collection of skills while propositional knowledge is a collection of facts. Tasks like cooking, driving, playing a musical instrument and operating a machine involve procedural knowledge.

**Propositional Knowledge (Also Called as Descriptive or Declarative Knowledge)**: Propositional Knowledge is that knowledge which gives knowledge about different things. Some examples of propositional knowledge are: An even number is divisible by two. A puppy is the young one of a dog. In India, citizens above the age of 18 years are eligible to vote. Such statements can be proved true or false. Propositional knowledge in turn may be of four kinds: logical, systemic, semantic and empirical.

**Logical Knowledge**: In this type of knowledge, we examine relationships between statements and draw conclusions based on the laws of logic.

**Example 1**: All quadrilaterals have four sides. A square is a quadrilateral. Hence, a square has four sides.

**Example 2**: Metals are good conductors of electricity. Mercury is a metal. Hence, mercury is a good conductor of electricity.

We use this kind of knowledge in Science, Grammar and Mathematics.

**Systemic Knowledge**: This kind of knowledge results from learning a system of words or symbols and examining how they relate to one another. For example, $21 + 23 = 44$ is systemic knowledge because we understand something specific when we use the terms ‘21’, ‘23’ and ‘+’.
**Semantic Knowledge:** Knowledge that arises due to the knowledge of meaning of words possessed by a person is called as semantic knowledge. For example, if someone says ‘Unmarried boys are bachelors’, we understand what we say but at the same time we do not call a four-year-old boy as a bachelor. This is because we have a definite understanding of the term ‘marriage’ and we acknowledge that it does not refer to four-year-old individuals. Thus, semantic knowledge is practical knowledge.

**Empirical Knowledge:** Empirical knowledge comes from our senses. Observation, generation of hypotheses, testing and confirmation (or refutation) of hypotheses result in empirical knowledge. John Locke when referring to empirical knowledge says ‘all ideas come from sensation or reflection’. Such knowledge can be tested both logically and through experimentation. It is used to describe and predict phenomena. It is communicated by qualitative and quantitative descriptions, empirical hypotheses, empirical definitions, generalizations and scientific laws. Some examples of empirical knowledge are Newton’s Laws of Motion, Dalton’s Atomic Theory, etc.

**Implications:** A teacher must be familiar with the different types of knowledge. A wise blend of these types will result in effective teaching-learning. In order to ensure healthy classroom interaction, a teacher needs to have personal knowledge about the students, their aptitude, entry behaviour, interests and needs. Teaching without procedural knowledge is meaningless. One needs to have robust knowledge about the process of learning. To evaluate students effectively, procedural knowledge is important. Procedural knowledge of the use of technology helps to enhance the quality of teaching. Propositional knowledge helps a teacher to deal with issues and challenges that come in the way of effective teaching. Effective planning requires logical knowledge. Every teacher is expected to be a practitioner-researcher and here the importance of empirical knowledge cannot be undermined. Analysis of the society around us, identification of problems and formulation of remedies to these problems involves different types of knowledge.

### 1.4 SITUATIONAL, CONCEPTUAL AND STRATEGIC KNOWLEDGE

Epistemology is a branch of philosophy concerned with the sources of knowledge. **Situational Knowledge** is knowledge about situations as they appear typically in a particular domain. For example, a motor cycle rider knows that if the road is slippery, the motorcycle is likely to skid due to reduced friction between the road and the tyre. A teacher in the class knows that if she/he uses unfamiliar vocabulary, students will not understand the content. So, the teacher simplifies the content by using familiar vocabulary or by using the local language. The teacher is using situational knowledge. During problem solving, one sifts relevant and irrelevant information. This is also an application of situational knowledge. In short, situational knowledge is knowledge about the situation, its components and the kind of relationship that exists in these components.

**Conceptual Knowledge** is static knowledge about facts, principles and concepts related to a situation. This knowledge plays an important role in how we apply our knowledge. A teacher must have conceptual knowledge of the teaching-learning process. She/he must know about classroom management strategies, evaluation techniques, learner psychology, etc. However, just this kind of conceptual knowledge is inadequate. To use conceptual knowledge effectively, it must be combined with situational knowledge. A doctor must have conceptual knowledge regarding medicines, diseases and their symptoms, etc. At the same time, situational knowledge is also required to treat the patient.

**Strategic Knowledge** is the knowledge whereby one decides the stages one needs to follow to solve a problem. A strategy is a series of steps that need to be taken to reach a particular goal. Consider this case. A Class Five student is unable to multiply two 2-digit numbers. The teacher finds
that the child knows addition and multiplication tables but does not know about place values. The child makes mistakes when the product is a 2-digit number and he has to ‘carry over’ a digit. After identifying the problem, the teacher decides to first give the child practice in place values, make the child understand that 14 means ‘1 ten and 4 ones’. Thus, the teacher is using strategic knowledge to help the child learn to multiply two 2-digit numbers.

1.5 SOURCES OF KNOWLEDGE

‘Where do we get our knowledge from’ is always a question for debate. Empiricism holds that knowledge is primarily got through our experience. Senses help us to perceive and learn. Empiricism does not believe that knowledge is innate. Empiricism believes in experimentation and observation to draw inferences. For example, the knowledge that the earth is spherical in shape first came from observations such as the shadow cast by the earth during an eclipse. Other heavenly bodies are spherical, so it was concluded that the earth is also spherical. Modern day technology supports this with actual photographs. Rationalism, on the other hand, accepts knowledge based on reason. Rationalists hold that at least some of our knowledge is derived from reason alone, and that reason plays an important role in the acquisition of all of our knowledge. In this case, the mind, rather than the senses, is responsible for generation of knowledge. Though in most cases, we demand an empirical proof, yet in reality we find that we use a blend of rationalism and empiricism to build knowledge.

Indian philosophy states that percepts are the starting point of knowledge generation. The senses are the gateways of knowledge. They provide information which is then processed by the mind to generate knowledge. Pratyaksha or perception by the senses is the primary source of human knowledge. Sensory perception, through the use of the sense organs, is accompanied by mental perception. Another source of human knowledge is inference or anumana. This goes beyond the unseen. While perception focuses on specific experiences, inference uses generalizations to gain knowledge. The third source of knowledge is Shabdha or words. Formal education widely uses this means to transmit knowledge or help generate knowledge. Vedanta philosophy also considers comparison (upamana) and postulation (arthapatti) as sources of knowledge.

**Implications in Teaching-Learning:** In real life, all types of knowledge are used in a blended form. Consider a situation where a teacher finds that a student is extremely disruptive in the class. The student disturbs other students and lags behind in his work. To deal with this case, the teacher needs conceptual knowledge (knowledge about achievement of students, attention-deficit disorders, hyperactivity, and classroom management strategies). The teacher notices that the child disturbs only
during certain subjects. He is very attentive during Language classes, but is disruptive during Mathematics class as he is unable to do even simple problems. He is well behaved during English class as he is proficient in the language, but the Hindi teacher has complaints about the student and says that his knowledge of Hindi is poor. When the teacher understands the relationship between different aspects of the situation, the teacher is using situational knowledge. Now, to remedy the situation, the teacher draws a plan of action. She has observed the situation and found that the child is comfortable with certain students who assist him in subjects like Mathematics and Hindi. She uses this situational knowledge along with conceptual knowledge such as use of rewards and plans a strategy to modify the behaviour of the students. Now, the teacher is using strategic knowledge.

Terms as knowledge and skill, knowledge and information, training and teaching are used during discussions about matters pertaining to education. These terms have definite connotations and it is necessary to understand what these terms exactly mean.

1.6 KNOWLEDGE AND SKILL

Knowledge is the theoretical or practical understanding of a subject. We need knowledge of various topics in order to perform our daily work effectively. Possessing knowledge does not guarantee that the person can use that knowledge effectively. For example, a person has knowledge about the parts of the CPU of a computer, but it does not mean that she/he can assemble these parts to have a CPU working. A person may be able to explain everything about swimming, the different strokes in swimming and how to swim efficiently but may not be proficient in doing so.

Skills are the proficiencies developed through training or experience. Skills are usually something that has been learned. Skills can be developed through the transfer of knowledge. For example, by actually assembling different parts of the CPU, a person with theoretical knowledge becomes proficient at the task. A person who has knowledge about decorating cakes will become skillful at the task only through training or experience. Actual interaction with the learning situation in practice is necessary to imbibe a skill.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge involves theoretical or practical understanding of a subject.</td>
<td>Skill involves proficiencies developed through practice.</td>
</tr>
<tr>
<td>It is the state of awareness about something.</td>
<td>It is the ability to do something.</td>
</tr>
<tr>
<td>It involves ‘knowing that’ aspect.</td>
<td>It involves the ‘knowing how’ aspect.</td>
</tr>
<tr>
<td>May not involve actual interaction with the learning situation.</td>
<td>Involvement with the learning situation is required to imbibe a skill.</td>
</tr>
</tbody>
</table>

Example: Smita knows the vital aspects of a dance form. She can tell us about the postures, expressions involved. But she cannot perform the dance form. This means Smita has knowledge of the theoretical aspects of the dance form.

Example: Smita can perform the dance form incorporating all its necessary elements. She possesses the skill of dancing.

Implications: Knowledge resides at the cognitive level whereas skills have more to do with the psychomotor level. Knowledge and skills are complementary. Knowledge without skill will render the knowledge to be impractical. Having the skill to do something but lacking in adequate knowledge will mean that the task is done with mediocrity. A teacher with thorough knowledge of the content and pedagogy can teach effectively if she/he possesses the skill of teaching. A parent may know much about parenting but may not be able to actualize the same due to lack of skill. Thus, while knowledge provides the scientific basis need for a task, skills provide the artistic aspect.
1.7 TEACHING AND TRAINING

Teaching refers to imparting knowledge or instructing through experience, example or precept. Training, on the other hand, is forming through drill or practice. Teaching is mostly theoretically oriented whereas training is practical oriented. Teaching provides new knowledge to the people while training helps the person to learn the tools and techniques to apply the same. Training stresses on attaining specific skills and abilities in a short period but teaching emphasizes attaining knowledge, understanding and wisdom over a longer period of time. Training involves intensive knowledge over limited domains but teaching involves extensive knowledge spread over vast domains. Teaching may relate to the subject area whereas training relates to functional area. Training is often considered as a subset of teaching. Teaching brings out the capability to acquire knowledge whereas training brings out your hidden talent. For example, Sudha’s teacher exposes Sudha to different forms of dance, the hand and foot movements involved etc. Here, the teacher is teaching her dance. But if Sudha works under the teacher, practicing her hand and foot work, adding finesse to her dance, she is being trained as a dancer. Training involves interaction; the learner has to be participatory in order to learn through training. Teaching, on the other hand, may involve passiveness on part of the learner. The goal of teaching is to enrich the mind while the goal of training is to master some specific skills. Often, teaching and training go hand in hand. For example, Amir is trained as a singer. But for this, he needs to be taught how to modulate his voice or which muscles need to be controlled when singing at a particular pitch. Teaching often comes ahead of training as a strong knowledge base helps to achieve skills more efficiently.

<table>
<thead>
<tr>
<th>Teaching</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching involves imparting knowledge or instructing through experience, example or precept.</td>
<td>Training involves formation through drill and practice.</td>
</tr>
<tr>
<td>Theoretical in nature.</td>
<td>Practical in nature.</td>
</tr>
<tr>
<td>May relate to the subject area with focus on content aspect.</td>
<td>May relate to function area with focus on skill aspect.</td>
</tr>
<tr>
<td>Involves intensive knowledge over limited domains.</td>
<td>Involves extensive knowledge over vast areas.</td>
</tr>
<tr>
<td>A teacher creates an awareness of the concept and provides new knowledge.</td>
<td>A trainer helps in understanding the practical application of this knowledge.</td>
</tr>
</tbody>
</table>

1.8 KNOWLEDGE AND INFORMATION

Information refers to data that has been processed. For example, if someone says ‘the population of India is 1.25 billion and the area of India is approximately 32 lakh sq. km.’, it is mere information. Knowledge is the ability to make meaning out of this information. So, in the above example, when someone uses the information provided and concludes that ‘the population density is about 386 people per sq. km.’ and that makes India quite densely populated, the person is generating knowledge on the basis of the information. Information comes first and knowledge follows from information. Information looks at just the presentation of data whereas knowledge examines the patterns within the given information. Acquiring information does not involve cognitive ability but acquiring knowledge does need some amount of cognitive action. Information is context independent. In case of knowledge, the context influences the meaning. Information can be reproduced but knowledge is not identically reproducible. Consider this example, the students of Class Three read the sentence ‘Mohan and his friends visited the soft drink plant’. Though all received the same information in the form of the sentence, different students formed different images of the scene. Some thought of the word ‘plant’ from botanical terms as they did not have knowledge of the alternative meanings of the word ‘plant’.
They literally visualized a tree-like structure that yielded soft drinks! Mere information is useless, it must be accompanied by right knowledge which involves some kind of cognitive processing using concepts and images.

Comparison of information and knowledge by Sveiby states that:

- Information is static whereas knowledge is dynamic.
- Information is independent of the individual but knowledge depends upon the individual. For example: Two people see a green circle on a food packet. This information is available to both. But one understands that it represents ‘vegetarian food’, the other does not make out any meaning. Thus, though both had the same information, knowledge constructed by both differs.
- Information has limited intrinsic meaning but knowledge has meaning which is personally assigned by the knowledge seeker.
- Information is like raw material. Knowledge is the product of the raw material which is the result of some kind of cognitive activity. Many people had seen apples fall from trees. But Isaac Newton converted that information into the knowledge of gravity by interacting with his experience.
- Information may exist in books, on websites or such other media. Knowledge uses these bricks of information to make a meaningful cognitive structure.
- Information is explicit. Knowledge is tacit. Information is what is seen by all. Tacit knowledge is not seen openly. It may be revealed through some kind of action performed by the one who possesses the knowledge.

<table>
<thead>
<tr>
<th>Information</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information is data that has undergone processing.</td>
<td>Knowledge refers to the ability to make meaning out of the processed data.</td>
</tr>
<tr>
<td>Information is static.</td>
<td>Knowledge is dynamic.</td>
</tr>
<tr>
<td>Information has limited intrinsic meaning.</td>
<td>Knowledge has meaning as applied by the knowledge seeker.</td>
</tr>
<tr>
<td>Information is like raw material subjected to very limited cognitive activity.</td>
<td>Knowledge is the product of raw material and is influenced by the cognitive activity in the mind of the individual.</td>
</tr>
<tr>
<td>Information is explicit, visible to all.</td>
<td>Knowledge is tacit and is revealed only when one performs an action.</td>
</tr>
<tr>
<td>Information does not involve awareness and intuition.</td>
<td>Knowledge involves awareness and intuition and depends on maturity of the individual.</td>
</tr>
</tbody>
</table>

Implications: Education widely makes use of both information and knowledge. To ensure effectiveness of teaching-learning, we rely on information. To design a proper curriculum, we need information about different aspects. But limiting ourselves to information is not enough. Information ought to be used like Lego blocks which can be rearranged to design a structure. Students often resort to mugging up information and reproducing it verbatim during examinations. This must be discouraged and rather they should be encouraged to sift and sieve through information, select what is required and use this information to build knowledge. For this, skills of discernment, critical thinking, analysis and synthesis need to be emphasized.

1.9 BELIEF AND REASON
Belief is an acknowledgment that certain things are true but it may be beyond the capacity of the human being to prove their truth. A belief is an assumed truth. It is a mental attitude that something is true. Our actions are led by what we believe. In the Middle Ages, people believed that diseases were caused by bad blood and so they let out blood to cure a disease. Forming beliefs is a basic feature of the human mind. When beliefs are justified and proven true, they assume the form of knowledge. All beliefs are not true. For example, people believed that the Sun moved around the Earth. This belief was proved false when Copernicus put forth his findings. People in some cultures believed that smallpox was caused by the wrath of a goddess but this was proved false when the smallpox virus was discovered. Beliefs need to be examined for their truth.

Reason is man’s tool of understanding. Reasoning demands a proof that can be examined with our senses. Reason depends on logic and often includes observation and testing to explain how or why something happens. Reason depends on the human mind. Reasoning begins with perception, which helps to form concepts which then integrate to form knowledge. This new knowledge in turn is assimilated into old knowledge strengthening the existing structure of knowledge. Reason is organized. It is systematic and purposeful. Logic, deduction and induction are tools used for reasoning. When the process of reason is applied to reality, knowledge emerges. For years, man had seen eclipses occurring. Certain beliefs were woven around eclipses and many people still follow some customs during eclipses due to their beliefs. People believed that eclipses were caused by demons swallowing the heavenly bodies. Today, due to science, we know that eclipses are caused when a heavenly body comes in the shadow region of another heavenly body. With logic and deduction, we have reasoned out why eclipses occur. Thus, reason is required to accept or refute a belief.

<table>
<thead>
<tr>
<th>Belief</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>A belief is an assumed truth.</td>
<td>Reason is a tool to understand different events.</td>
</tr>
<tr>
<td>Belief does not demand proofs.</td>
<td>Reason only accepts things for which proofs can be given.</td>
</tr>
<tr>
<td>Belief does not provide justification or explanations but accepts a given statement as true.</td>
<td>Reason is a cause, explanation, or justification for an action or event.</td>
</tr>
<tr>
<td>Belief is often led by intuition or emotions. It is, therefore, quite unsystematic and no logic may be involved.</td>
<td>Reason is organized. It is systematic and purposeful.</td>
</tr>
</tbody>
</table>

**Implications:** One aim of education is emancipation of human beings from the bonds of ignorance. Beliefs which arise out of lack of adequate reasoning cause man to be a slave of his own thoughts. This can be an obstacle in our progress. Reasoning encourages scientific attitude and logical thinking and thus helps a person to examine his own beliefs. True education encourages reason. Teachers should identify the beliefs of students and help them examine this belief system. Holistic development is fostered through reasoning. Society progresses when it emphasizes reason. If we compare the European society and Indian society of the 18th century, we can see that the Indian society was a victim of prejudices which came from people’s beliefs. On the other hand, Europe had entered the Age of Reason. Movements like the Renaissance and Reformation followed by the Industrial Revolution all rested on the use of reason.

**1.10 CONCEPT OF EDUCATION: MEANING AND CHARACTERISTICS**

Education is a widely used term. Philosophers right from Yajnavalkya who lived around 1000 B.C. to J. Krishnamurti of the 20th century have discussed about education. The word education had several etymological roots. ‘Educare’ means to raise up, to train, to mould and to nourish. ‘Educere’ means to draw out and ‘educatum’ refers to the act of teaching or training. It throws light on the
principles and practice of teaching. The Sanskrit word ‘shiksha’ comes from the root word ‘shaaas’ which is to discipline. Another widely used term ‘vidya’ comes from the word ‘vid’ which means to know. Thus, education refers to the art of drawing out or nourishing what is inherent in a person.

Some views on the term ‘education’ are given below:

- Education means drawing out the best in child and man – body, mind and spirit. (Gandhiji)
- Education is the process of living through continuous reconstruction of experiences. (Dewey)
- Education is the natural, harmonious development of man’s innate powers. (Pestalozzi)
- Education is the manifestation of the divine already present in man. (Swami Vivekanand)

Analyzing these views, one can say that education is a lifetime experience. It is not restricted to just cognitive aspects but considers skills and attitudes as well. Education is an internal compass that provides direction to life. Martin Luther King views development of intelligence and character formation as the twin goals of education. While speaking about education, many people make the mistake of equating education to literacy but true education goes way beyond literacy. Education changes a society from a mere literate society to a learning society. It equips man with skills and knowledge which in turn facilitate earning a livelihood. In a very narrow sense, education deals with instruction rendered in formal institutions.

The 1990 Declaration of the World Conference on ‘Education for All’ held at Jomtien, Thailand states that basic education is more than an end in itself. It is the foundation for lifelong learning and human development on which countries may build, systematically, further levels and types of education and training. All efforts of the UNESCO right from the Constitution adopted by UNESCO in 1945 to the Dakar Framework of 2000 emphasize the importance of education.

Broadly speaking, education is gearing one for life itself. Different philosophical schools visualise different goals for life. Accordingly, the aims of education were based on these philosophical aims. For example, the pragmatists believed that education must cover all that is practical in life whereas the idealists believed that education must encompass all the ideals of life. The naturalists believe that education should help in self-preservation and self-expression.

1.10.1 Characteristics of Education

1. **Education Goes Beyond Mere Institutional Education:** Education is not co-terminus with institutional education. One can get education even beyond the formal school system. Home, media, excursions and other experiences also provide vital education. Schooling is merely attending an institution, but education goes beyond schooling.

2. **Education is a Lifelong Process:** It is a process of growth. One keeps educating himself through experiences from birth till death.

3. **Education Brings about Integrated Development of Individual:** Education is not mere cognitive development. Development of attitudes and skills is also a part of education.

4. **Education is a Tri-polar Process:** The three poles being educator, educand and society. The educator could be a teacher, parent, elder, media, peers, books or any such source. The educand is the learner, unrestricted by age, maturity and previous knowledge. Society or the learning environment is an integral part of education.

5. **Education is Need-based:** One seeks education if it is of some use. A person seeking a better placement in his workplace would look out for sources to learn skills needed to enhance job prospects. An elderly person may learn to interact through video conferencing as he wants to talk to his children abroad.
6. **Education as a Transmitter and Preserver of Culture**: Education got from one’s family or social setup helps to preserve and transmit culture. Celebration of community festivals, for example, transmits cultural values. Such experiences are part of informal education.

7. **Education as Manifestation**: Education is the process of manifesting what is latent in each child. It is the process where the teacher plays the role of a gardener to bring out innate capacities of the child through the appropriate method. Knowledge is inherent in man. What one learns is only by means of discovering what he carries in himself.

8. **Education as Acquisition**: Here, education lays emphasis on the ability of man to acquire information by inquiry into the nature of the external world – taking in what exists outside the learner. The brain of the child is like a sponge absorbing what it finds significant in the external environment.

9. **Education as Transaction**: Education is a give-and-take process between man and his environment. The teaching-sculpting process results in transformation of human material from something that is dull and rough to something that is smooth and polished. The teacher hands over to the student the knowledge and skills he needs. The teacher has to be active in teaching and the student has to be receptive.

1.10.2 **Education as a Dynamic Process**

It is also interesting to note how the concept of education has evolved down the ages. The traditional pattern of education focused on knowledge of subjects with emphasis on the three R’s of Reading, Writing and Arithmetic. Most of the education pertained to religious matters. Curriculum was subject-centred. The family and religious institutions were centres of education. The concept of child centric education was unknown. Individual differences were not considered and the process of education followed the ‘one size fits all’ norm. Didactic methods which focused on rote memorization were widely used. Discipline and the evaluation system were rigid. As the concept of education slowly evolved, the focus of education shifted from the three R’s to the R’s of Reading, Writing, Arithmetic, Rights, Responsibilities and Relationships. Secular schools were set up. Curriculum became activity-centred. The all-round development of the child was now considered important and hence activities were included as learning experiences. Constructivist approach gained importance. Individual differences were accepted and inclusive education was promoted. The teaching-learning methods have shifted from teacher-centric to student-centric approaches. Self-discipline is now emphasized. Evaluation patterns too have evolved and continuous, comprehensive evaluation system is widely accepted. New technologies are being integrated into education. Thus, education is a dynamic process.

**1.11 THE KNOWLEDGE-EDUCATION CONNECT**

Education and knowledge are closely connected. The basic aim of education is to help the individual increase knowledge and translate it to action. The present economy is often called as the Knowledge Economy. A Knowledge Economy is one that utilizes knowledge to develop and sustain long-term economic growth. Such an economy rests on four pillars: (i) an economic and institutional regime that is conducive to the creation, diffusion, and utilization of knowledge, (ii) a well educated and well skilled population, (iii) a dynamic information infrastructure that facilitates the communication, dissemination, and processing of information and technology and (iv) an efficient innovation system of firms, research centres, universities, think tanks, consultants, and other organizations that applies and adapts global knowledge to local needs to create new technology.

The Knowledge Economy Index (KEI) 2012 ratings provided by the World Bank, list Sweden as the leading nation with a KEI of 9.43. India is at 110th position with a KEI of 3.06. In the next few
years, India with a large percentage of youth will have an edge over many other nations. But this asset can be beneficial to the country only if these youth are educated and skilled. There is an urgent need to improve many aspects of our education system and leverage India as a leader in the world economy.

Questions to Evaluate Yourself

1. What is knowledge? Explain the main characteristics of knowledge.
2. ‘Personal, procedural and propositional knowledge are vital to all individuals.’ Explain the statement with relevant examples.
3. Explain the concepts ‘knowledge’ and ‘skill’ with suitable examples.
4. Illustrate with suitable examples: personal, procedural and propositional knowledge.
5. What is education? Elucidate the characteristics of education.
7. ‘Teaching and training are an integral part of our education.’ Elucidate with reference to the importance of teaching and training.
8. ‘Information is a prerequisite to knowledge.’ Justify.
9. ‘Mere information may be useless. It must be translated to knowledge.’ Justify.
11. ‘An individual is the product of both teaching and training.’ Illustrate bearing in mind the relevance of teaching and training in the life of an individual.
12. ‘Situational, conceptual and strategic knowledge are all important sources of knowledge.’ Explain this statement with emphasis on the relevance of these three sources of knowledge.

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5. http://www.theoryofknowledge.info/what-is-knowledge/
About the Author

Dr. Agnes D’Costa, M.A. (History), M.Sc. (Inorganic Chemistry), M.Ed., Ph.D. (Edu), SLET, has about 20 years of experience as a teacher-educator and nine years of experience as a high school teacher. Presently, she is an Associate Professor at Pushpanjali College of Education, Vasai, Maharashtra. She is the winner of NCERT 2012 Award for ‘Innovative Practices in Teacher Education’ for her research ‘Open Educational Resources in Teacher Education’. She has published two books ‘A Call for Constructivist Classrooms’ and ‘Empowering Leaders’. She is associated with Curriculum Preparation for e-B.Ed. programme launched by Yeshwantrao Chavan Maharashtra Open University. She is recognized as an expert for evaluation of e-content by Central Institute of Educational Technology, NCERT. Her contribution to Open Education Resources on wikieducator has won her the Best User Page Expo Award from wikieducator in September 2010. These resources can be accessed from www.wikieducator.org/User:Agnes. She conducts workshops on varied topics for parents, principals and teachers. She has published many papers and articles on topics of educational significance.

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