Unit-I

Disciplines and Subject

Meaning of Disciplines

The term "Discipline "Originates from the Latin word 'Discipulus (Pupil or Learners), which later became 'Disciplina' and then changed to 'Discipline' which means 'Teaching or Knowledge'.

A discipline is a focused study in one academic field or profession. A discipline incorporates expertise, people, projects, communities, challenges, studies, inquiry, and research areas that are strongly associated with a given discipline.

An academic discipline or field of study is a branch of knowledge that is taught and researched as part of higher education. Examples of academic Disciplines are Anthropology, Space Science, Psychology, Sociology, archeology, Education etc.

Definition for Academic Discipline

Discipline is defined by the Oxford English Dictionary as "a branch of learning or scholarly instruction"

"An Academic discipline is a field of branch of learning affiliated with an academic department within a university, formulated for the advancement of research and scholarship and the professional training of researchers, academics, and specialists."

Zongyi Deng

"An academic discipline or field of study is a branch of knowledge that is taught and researched as part of higher education"

-Antony Biglan

"A Branch of knowledge or learning which is taught or researched at the college or university level"

-Glosbe

Characteristics of Discipline

- Disciplines have a particular object of research (eg.Law, society, politics) through the object of research may be shared with another discipline.
- Disciplines have a body of accumulated specialist knowledge referring to their object of research, which is specific to them and not generally shared with another discipline.
- Disciplines have theories and concepts that can organize the accumulated specialist knowledge effectively.
- Disciplines use specific terminologies or a specific technical language adjusted to their research object
- Disciplines have developed specific research methods according to their specific research requirements, and may be most crucially.
- Disciplines must have some instructional manifestation in the form of subjects taught at universities or colleges, respective academic departments and professional associations connected to it. Only through institutionalisation are disciplines able to reproduce themselves from one generation to the next by means of specific educational objectives.

School Subjects

Meaning

The subject in a sentence or clause is the person or thing doing, performing or controlling the action of the verb. Only that which has the grammatical function of a noun can be the subject of a clause. This is because it is someone or something that is capable of "performing" or "Controlling"that the action of the verb.

Humanist educators argue that school subject are created to provide students with "intrinsically rewarding experiences" that contribute to the pursuit of self-actualization, personal growth, and individual freedom. School subjects, therefore, need to be formulated according to the interest, attitudes, and developmental stages of individual students. The need to derive content from a wide range of sources such as personal experiences, human activities, and

community cultures and wisdoms. Disciplinary knowledge might(or might not) be useful for the formation of school subjects.

From the perspective of social efficiency, school subjects are contracted for the primary purpose of maintaining and enhancing economic and social productivity by equipping future citizens with the requisite knowledge, skills, and capital. The formation of school subjects, therefore, is justified with close reference to the needs of occupation, profession, and vocation. Specialized and applied field(e.g.Engineering, accounting, and marketing, among others), therefore, are the primary sources from which the contents of school subjects are derived.

For social reconstructions, school subjects are created to provide students with meaningful learning experiences that might lead to emancipation and engender social agency. To this end, the formation of school subjects is based upon an examination of social contexts, social issues, and futures, with the intention of helping individuals reconstruct their own analyses, standpoints, and actions.Like humanistic educators, social Reconstructionist believe that school subjects derive content from a wide range of sources.

Definition of School subject

"A school subject refers to an area of learning within the school curriculum that constitutes and institutionally defined filed of knowledge and practice for teaching and learning"

-Zongyi Deng

Characteristic of school subjects

- A school subject is an area of learning within the school curriculum that constitutes an institutionally defined field of knowledge and practice for teaching and learning.
- School subjects can be traditional academic subjects, such as mathematic civics, history, geography, physics, chemistry and economics
- Newly, there are some unconventional school subjects like tourism and hospitality.
- Academic school subjects, such as mathematics, chemistry, geography, history and economics, are to be compulsorily taught to the students

- The content of these academic subjects needs to be worked with and transformed by the teachers in such a way that it is appropriate for classroom teaching
- Constructing a school subject is in accordance with respect to both the societal expectations and the activities of teaching
- Thus, a school subject is the result of institutional selection, organization, and framing content for social,economic, cultural,curricular and pedagogic purposes
- A school subject constitutes and organizing framework that gives meaning and shape to curriculum content, teaching and learning activities
- A school subject constitutes an organizing framework that gives meaning and shape to curricular content, teaching and learning activities
- School subjects are distinctive, purpose built enterprises, constructed in response to different social, cultural, and political demands and challenges, and towards educational aims
- Thus a school subject contains content, and translating content for educational purposes.

DISTINCTION BETWEEN SCHOOL SUBJECTS AND ACADEMIC DISCIPLINES

BASIS OF DIFFERENCE	**SCHOOL SUBJECTS**	**ACADEMIC DISCIPLINES**
Aims of education	Development of basic skills and awareness. Development of a social citizen.	Development of specialized knowledge and skills. Development of scholars, researchers, academics, specialists, etc.,
Nature of content	Simple ideas and information's.	Complex theories of educators.

Curriculum construction	Considering needs, wants of learners. Includes learner centered teaching methods.	Contents are arranged for the development of different specialized skills at complex and wider levels.
Development of skills	Gives importance for the development of basic skills such as reading, writing and arithmetic.	Gives importance for the development specialised skills, mainly professional and vocational skills
Area of operation	Limited to Schools.	For university and other higher education.
Developmental phases	School subjects come first in the development of a person.	Academic disciplines come later in one's learning journey from school to university.

IMPORTANCE OF THE KNOWLEDGE OF DISCIPLINES AND SUBJECTS:

- The central purpose of a school subject, like that of a discipline, is to initiate the young into the academic community of scholars.
- School subjects, therefore, are supposed to derive their life ,from their related intellectual disciplines.
- School subjects constitute a faithful and valid introduction to the academic disciplines whose names they bear.
- Students are dealing with relatively simple ideas and methods; they study the same ideas and methods known by experts in the academic disciplines.
- The exclusive reliance of the curricular position on academic disciplines in defining school subjects leaves out other kinds of knowledge (E.g.,Practical knowledge,technical knowledge, Local Community knowledge, community knowledge,etc.)that could be potential curriculum content.

- Curriculum development framed by this curricular position ignores the interests,attitudes,and feelings of learners. Furthermore, this curricular position shows little concern about meeting social,economic,and political needs, and is silent on issues about social reform and reconstruction.
- The world of knowledge, the needs of learners and the needs and demands of society are three essential factors that determine and shape the curriculum content and set school subjects apart from academic disciplines.
- Humanist educators argue that school subjects are created to provide students with rewarding experiences that contribute to personal growth and individual freedom. School subjects, therefore, need to be formulated according to the interest, attitudes, and developmental stages of individual students. They need to derive content from a wide range of sources-such as personal experiences, human activities and community cultures and wisdoms. Disciplinary knowledge may or may not be useful for the formation of school subjects.
- From the perspective of social efficiency, school subjects are constructed for the primary purpose of maintaining and enhancing economic and social productivity by equipping future citizens with the requisite knowledge, skills, and capital.
- The formation of a school subject, therefore, is justified with close reference to the needs of occupation, profession and vocation.
- Therefore, specialized and applied fields like engineering, accounting and marketing, among other, are the primary sources from which the contents of school subjects are derived.
- Academic disciplines are drawn upon only when they demonstrate their efficacy in promoting those skills and knowledge actually needed in occupations.
- School subjects are created to provide students with meaningful learning experiences that might lead to liberation and cause social activity.
- The formation of school subjects is based upon an examination of social contexts, social issues, and futures, with the intention of helping individuals reconstruct their own, standpoints, and actions.
- Like humanistic educators, social re-constructionists believe that school subjects derive contents from a wide range of sources. Contemporary curricular views like autonomous

learners, participatory citizenship and globalization further set school subjects apart from academic disciplines.

- The curricular discourses call for a learner-oriented approach to the construction of a school subject that allows learners to construct their own knowledge according to their individual needs and interests.
- The curricular discourses require the school subject to be formulated in ways that help students cultivate certain kinds of sensitivity,disposition and awareness needed for responsible participation in society.
- The school subjects equip students with general skills and lifelong learning abilities,essential for facing the challenges of globalization and the knowledge-based economy.

Need and importance of studying school subjects

- To develop basic skills like, Listening, reading, writing and arithmetic
- To enhance students' understanding of themselves, their society, their nation, the human world and the physical environment.
- To enable students to develop multiple perspectives on contemporary issues in divergent contexts(e.g. Cultural, social, economic, political, and technological contexts)
- To help students become independent thinkers so that they can construct knowledge appropriate to changing personal and social circumstances
- To develop in students a range of skills for lifelong learning, including critical thinking skills, creativity, problem-solving skills, communication skills, and information technology skills.
- To help students appreciate and respect diversity in cultures and views in a pluralistic society and handle conflicts values
- To help students develop positive values and attitude toward life, so that they can become informed and responsible citizens of society ,the country and the worlds
- They contribute to the pursuit of self-actualization, personal growth, and individual freedom.

Mathematics

Mathematics is extremely important in our society. Number sense and arithmetic are so incredibly important that one would not get far without it. Almost all sciences rely on math and logical thinking, and also go hand in hand. Back in Greek times, it was only taught to the upper class. These days, math can be a grippingly complex subject at the higher end of the study, but it still is extremely important for almost all aspects of life. Mathematics gives a chance to create a world with numbers.

English

English is only for people who are interested in learning languages.It is an important life skill to take on board from school, then on to the university and then speaking in job interviews using correct English.Knowing English is surely helpful in understanding concepts(explained in English) of science and mathematics better.It is the world's international language and is absolutely needed everywhere, for everything, in order to be successful.

Science

Science fulfills the purpose of the world. It Demonstrates to us how things work and why they do so. When you pronounce words "science"people think of it as a boring, sophisticated and complex subject full of joy and can be very fun if you think of it as an interesting subject. By far, science is the most mysterious subject because there are lots of things to be discovered and that is what makes science an important subject

Science includes a vast amount of subjects including biology, astronomy, computer science, geology, physics, and more. Science can teach us to use factual information in research papers which increases our language skills. Science also uses applied mathematics to solve the problems of the world anduses knowledge of social studies to make the present and future better. Science and math is everywhere and practically everything

History

History is so important because we have to prevent the past from repeating itself, which is very similar to what is often portrayed in time travel. History is probably the least important subject as we should not get hung up on the past.

Geography

Geography is our world, andif we don't understand it, then we can't prepare for the future, such as avoiding a tsunami. It affects us every day without many not knowing it, and we need to understand societies and cultures. Geography helps us make choices within our planet. Geography helps us to travel around the world. Geography is a subject that isneeded in everyday life from reading maps to going on a holiday

Physics

Physics help us understand how natural world happens physics is wonderful as it explains the world.Everything involves physics and a degree in physics is extremely valuable. It also increases out skills to think.

Chemistry

Chemistry is the one of the most important and central branches of all sciences. Chemistry opens the door for many careers because training in chemistry is essential for many positions in industry, is highly desirable for science teaching and is useful for careers in the public service and management.Both the public and the private sectors increasingly draw their higher management echelons from chemistry graduates. But most importantly, it is just so fascinating

Biology

Everyone needs to study about animals and human body to know how to cure the sick. This is the most important science. Biology implies an essential responsibility for the welfare and protection of all living species. It studies all living beings and how organisms interact in the biosphere. This is essential because it enables people to know the behavior and functions of each population that interacts with individuals from other populations were how the specific aspects of the biosphere affect and benefit from the behaviours of a particular population

Biology also studies the origin of diseases and plagues, such as infections, pathologies of animals and damage to plants and tress. Biology encompasses the study of the functions of living beings, enhancement of useful species, factors that cause illnesses, discovery and production of medicines and sustainable use of natural resources. Through biotechnology, biologists find efficient ways to produce food and other supplies for people. They investigate the processes involved in producing various nutritional substances

Economics

Economics is a such and undervalued field that incorporates all disciplines such as math and science. Plus, it allows individuals to think critically. That's why most lawyers, politicians and "wall street" executives have extensive knowledge in this field. It is one of the social sciences that is good for someone learning the basics of entrepreneurship.

Curriculum Content

Meaning

The term's curriculum or curricula use in educational contexts without qualification, specific examples, or additional explanation, it may be difficult to determine precisely what the terms are referring to, mainly because they could be applied to either all or only some of the component parts of a school's academic program or courses.

Curriculum content is defined as what the teacher and the students pay attention to when they are teaching and learning. It is a list of subjects, topics, themes, concepts or works to be covered. It is the subject matter, process, approaches, and feelings used in teaching as the curriculum is being implemented. Curriculum content refers to what is taught in school, it is the subject matter or topics consisting facts, concepts, ideas, knowledge within a particular subject and how they will bring about change in the individual and to the society .

Curriculum content is another main lever of education quality. The knowledge, skills and attitudes imparted by learning areas/subjects, cross-cutting approaches and extra-curricular activities are a main source of systematic and comprehensive learning. While learners may learn from many other different sources (especially in an informal way from the Media and Internet),

curriculum's advantages in structuring and sequencing learning represents a major asset for sustainable acquisitions that ought to be well exploited and capitalized on.

The Curriculum is defined as "the instructional and educational program through which the pupils achieve their goals and aspirations of life". The curriculum consists of components/elements such as the curriculum content, learning activities, learning experiences and lastly evaluation. All these components of the curriculum are interrelated and important for an effective curriculum implementation.

The term curriculum refers to the lessons and academic content taught in a school or in a specific course or program. In dictionaries, the curriculum is often defined as the courses offered by a school, but it is rarely used in such a general sense in schools. Depending on how broadly educators define or employ the term, curriculum typically refers to the knowledge and skills students are expected to learn, which includes the learning standards or learning objectives they are expected to meet; the units and lessons that teachers teach; the assignments and projects given to students; the books, materials, videos, presentations, and readings used in a course; and the tests, assessments, and other methods used to evaluate student learning. An individual teacher's curriculum, for example, would be the specific learning standards, lessons, assignments, and materials used to organize and teach a particular course.

Importance of curriculum content

Curriculum content is relevant when it meets the need of a society such as unemployment; by teaching what is relevant or related to societal issues at hand through practical and theoretical concepts. Furthermore, the curriculum is of social relevance when it gives solutions to the problems of the society such as pollution, deforestation and many more. The curriculum content should therefore meet the needs of society in which it is being implemented. Curriculum content should be localized if it has to meet the need of the immediate society.

John Dewey's Ideas on Disciplinary knowledge and curriculum

John Dewey was an American Philosopher, psychologist and educational reformer. He was born in 1859 and died in 1952.His ideas have been influential in education and social

reform. He was one of the early developers of pragmatism and functional psychology. The following are some of his ideas about education and society.

John Dewey viewed the subject matter as a distinctive and specialized domain of experience for learners. Subject matter consists of a body of facts, concepts, values, and techniques that are selected, organized, and sequenced in a way that centers upon the predetermined objectives. His ideas have been influential in education and social reform. He was one of the early developers of pragmatism and functional psychology. The following are some of his ideas about education and society.

He believes in social discipline based on the child's interests, activities and sense of social responsibility. According to John Dewey, discipline is a "mental attitude" and in order to maintain this attitude, socialized activates are essential. Socialized activities can be easily performed in "social project".Co-operative feelings and socialistic attitude can be developed through various project techniques. Pragmatism believes that "play "and "work" should be combined and this combination will develop a mental attitude: discipline, interest and sense of purpose. He will develop self-confidence, self-reliance, cooperation, sympathy and fellow-feelings for others. With the development of these social qualities he will fell for others. With the development of these social qualities he will develop a sense of social discipline and moral obligation towards self and others.

In this way this philosophy believes in discipline, but the discipline should not be the outcome of external force; it should be backed with freedom and joy.

Curriculum

Pragmatists favour the educational curricula which permit the educated to develop all his qualities and obtain all knowledge that he can use fruitfully in future life. They have suggested the perusal of following guidelines in determining a curriculum:

1) Principles of Utility

According to John Dewey, the children should be imparted the knowledge of only these subject and skills which are useful in their life. The needs of different children are different, so the knowledge of a subject or skill. Cannot be useful to all children. These knowledge and skills

should prepare them for their future life. Thus, the curriculum should include physical training, hygiene, language, history and geography, mathematics and science. For girls, domestic sciences or home sciences and boys agricultural sciences are prescribed.

2) Principles of Interests

According to John Dewey, the attitude of children is dynamic; they should be imparted education according to attitudes and interests. He has described four natural interests- interest in talking, interest in exploration or testing, interests in the creation and interest in aesthetic expression. According to Dewey, these natural interests are the natural resources on which the development of the children depends. Keeping these varieties of interest in view, at the primary stage the curriculum should include Reading, Writing, counting, art, craftwork, and natural science and other practical work or simple nature.

3) Principle of activity

The child is naturally self-active and he learns by doing. He has acquired many experiences, which gradually shape his personality. According to them the curriculum should be related to the real activities, experienced acquired from these activities and future activities of the children. John Dewey considered activity as the basis of the curriculum. According to him, only those subjects and activities should be included in the curricula which are related to the real life of the children. Hence, the curricula should consist of, besides different subjects, sports, social activities, and literacy and cultural activities

4) Principles of experience

John Dewey considered social experience as the basis of the curriculum. In his views the educational experiences of the children are constructive. Educational experiences include economic, political, industrial, physical and social conditions of the society. Hence the curriculum should consist of such varieties of learning experiences which promote original thinking and freedom to develop social and purposeful attitudes.

5)Principles of Integration

According to pragmatists, the chief basis of curriculum construction is integration. They consider knowledge as one unit. They opine that whatever knowledge is imparted to a child

should be integrated. Different subjects should not be taught separately. The knowledge of different subject should be correlated with another subject.

6) Principle of Learning by doing

The child is naturally self-active and he learned by doing. He has acquired many experiences, which gradually shape his personality. The child many experiences, which gradually shape his personality. The child cannot however be active in every lesson, but the teacher should so organize and plan it that it secures interests, attention and motivation in him and ultimately leads him to activity.

7) Project Method

Project method is more valuable for all round development of the child. It is against corporal punishment, favor in self-discipline, related to the development of life. Self-learning through experiences, believes in experimentation and experiences, Innovative learning and stress on actions.

Relationship between School Subjects and Academic Discipline

School subjects can have different and varying relationships to academic disciplines, depending on their aims, contents, and developmental phases. School subjects are derived from and organized according to the "structure" of academic disciplines. They constitute a faithful and valid introduction to the academic disciplines. While students are dealing with relatively simple ideas and methods in school subjects, they study the same ideas and methods known by experts in the academic disciplines. So school subjects are the connecting links to academic disciplines. Academic disciplines are of complex nature, and they are the continuation of school subjects.School subjects are the basis for the development of basic information that will turn the learners into specialists in academic disciplines. A school subject results from the transformation of an Academic Discipline. School subjects come first and academic disciplines later in one's learning journey from school to university. An academic discipline provides the endpoint for the formation of a school subject and the school subject furnishes the avenue for getting to know the academic discipline.

Unit-II

Disciplines and subjects in socio-cultural perspective

I) Emerge and development of knowledge, subjects and curriculum in social, political and intellectual context

i)Knowledge

Knowledge refers to the ideas or understandings which an entity possesses, that are used to take effective action to achieve the entity's goals. This knowledge is specific to the entity which created it.

Human mind is often seen capable of two kinds of knowledge, the rational and the intuitive. The Upanishads for instance speak about higher and a lower knowledge and combine lower knowledge with the various sciences

ii)Emerge and development of knowledge .A Methods of acquiring knowledge

- Knowledge through sense of experience
- Knowledge through intuition
- Knowledge through reasoning
- Knowledge test and experience
- Knowledge influence
- Knowledge order
- Knowledge social awareness
- Knowledge of actions
- Knowledge of training

B)Development of knowledge

- Communicative knowledge

According Oxford dictionary the knowledge means," science and practice of transmitting information". It shows the link between 'teaching' and 'communication'. Teachers frequently transmitting knowledge. From this it is clear that communication is a complex process. At any

stage, the sender or the receiver face any hurdle in communication it ends as less effective. So to be effective teachers try to minimise the barriers to communicate effectively.

- Parthial knowledge

In most cases it is not possible to understand a information completely, the knowledge we gain is always incomplete or partial. In real life situations people often have a limited amount of information and make decisions according to that.

- Scientific knowledge

Development of scientific method has made a significant contribution to how knowledge of the physical world and its phenomena is acquired. Scientific methods consist of the collection of data through observation and experimentation and the formulation and testing of hypothesis. Scientific knowledge now includes a broader usage in the soft sciences such as biology epistemology or genetic epistemology and to some extent related to 'theory of cognitive development'.

iii)Emerge and development of curriculum

a)Emerge curriculum is not an linear process

An emergent curriculum evolving in response to changing children's needs and interests, parental and community interests and concerns, and teacher's priorities. Each of these elements shapes the direction for future learning

b)Emergent curriculum is cyclical

As teacher should know about children and their families they observe students learning and discuss and share it with families of the children. The process is repeated continually.

c)Emergent curriculum is flexible and responsible

Teachers plan flexibility with children, as curriculum constantly change in response to children's interests, need and based on their strength.

d)Emergent curriculum is collaborative

Emergent curriculum gave opportunity for adults and children's to make correct decision.

e)Emergent curriculum makes children's learning and teachers thinking visible

Teachers establish learning with children colleagues and parents. They engage their discussion and reflection about their learning experiences with their partner. In the process teachers own thinking, planning and decision making is made visible.

i)Curriculum- subject context

Curriculum document focuses on specific subject content.

Quality of curriculum

- Greater depth and less superficial coverage
- Focus on problem solving
- Facilities the mastery of essential skill and knowledge
- Co-ordinated
- Effective integrated curriculum
- Mastery of al limited amount of objective

ii)Curriculum in the social context

- The education systems do not function in isolation from the society of which it is a part. Hierarchies of caste, economic status, gender relation, cultural diversity as well as uneven economic development in Indian society deeply influence education system and participation of children in school.
- Globalization and the spread of market relations to every sphere of society have important implication for education. On one hand, we are witnessing the increasing commercialization of education and the official thrust towards 'alternative' schools
- The increasingly competitive environment into which schools are being drawn and the aspirations of parents place burden on all children

- The social content of education in India present number of challenges addressed by curriculum. The attention to these challenges as well as some of the way in which they can be addressed.
- Opening the concept of knowledge to include new areas of knowledge and experience inclusivity in selecting learning tasks, pedagogic practices that are alert to promoting participation building self-confidence and critical awareness and an openness to engaging with the community to explain and share curriculum decisions are among the new ideas.

iii)Curriculum in the political context and intellectual context

Education is regarded as a political activity. National philosophy has a tremendous influence on the system because:

- Politics determine and define the goals, content, learning experiences and evaluation strategies in education
- Curriculum materials and their interpretation are usually heavily influenced by political considerations
- Political considerations may play a part in the hiring of personnel
- Funding of education is greatly influenced by politics
- Entry in to educational institutions and the examination systems are heavily influenced by politics

Curriculum Development

Curriculum development is defined as planned, purposeful, progressive and systematic process in order to create positive improvement in the educational system. Every time there are changes or development happening around the world, the school curricula are affected. There is a need to update them in order to address the society's needs

2)Changes in social science, natural science and linguistics

a)Meaning and concept of social science

In recent years STEM (Science, Technology. Engineering and mathematics) sciences have received the majority of investment and support from government, universities, etc. While these subjects are no doubt important, meanwhile the important of social science should not be ignored.

Generally social science focus of study of society and the relationship among individual within society. It covers a wide spectrum of subjects including economics, political science, sociology, history, archaeology and law. In comparison to STEM sciences, social science is able to provide insight into how science and innovation work in effect it is the science of science

ii)Changes in Social science

It is clear that no subject area can stand alone, walled off from the outside, and that social science can play an important role in all fields. Social scientists involve in solving many of the worlds' biggest issues, such as violent crime, alternative energy and cyber security. The choice between STEM and social sciences is really a false one, society needs people trained in both.

a)Subfield of social science

The range of contributors to the development of the social sciences characterized the terminology and nature of this transition in different ways community to society (Tonnes), (traditional to rational legal authority (Weber) Feudalism to capitalism (Marx)

History

Focusing on a narrative of the dynamics of collective entities, institutions communities' nation states, and the international order.

Politics

Focusing on the influence of power within the governing institution of nation states

Paralegal studies

Focusing on the study to employed or retained by a lawyer who perform specifically delegated substantive legal work for which a lawyer is responsible.

Sociology:

Focusing on how our humanity is shaped and constrained by social context within which we live our lives

Anthropology:

Initially differentiated from sociology in its focus on pre-modern communities, but now more characterized by its research traditions of immersive fieldwork and symbolic meanings more broadly.

Social geography:

Focusing on the spatial organization of human communities'

Political economy:

Focusing on how human societies and the international order are shaped by its processes of material production and distribution.

- Business studies
- Communication studies
- Criminology
- Demography
- Development studies
- Economics
- Education
- Geography
- History
- Industrial relations
- Law
- Linguistics
- Media studies
- Methodology
- Philosophy
- Political science
- Psychology
- Public administration

- Sociology
- Legal Management
- Paralegal studies
- International studies
- Library Science
- Information Science

Natural science

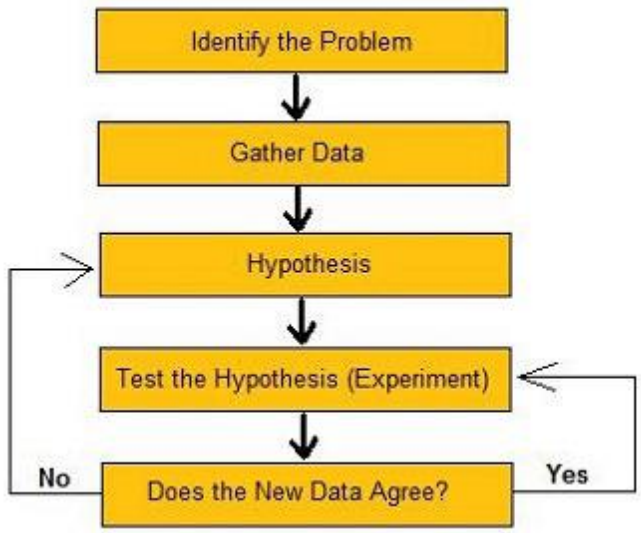
Meaning and definition of Natural science

Science is a set of tool and systematic methods for studying the natural world through observation and experimentation.

Changes in natural science

Basically humans love to find patterns and they have been looking for patterns in the world as long as they have existed. Human's brain however is not very reliable when it comes to identifying and explaining that patterns.Infact we can be pretty terrible at it.

Science is a way of avoiding, human's wrong instincts by using a systematic method: identify the problem, gather data, create a hypothesis test the hypothesis, test the hypothesis, does the new data aggress with hypothesis?



Branches of Science

The **branches of science** (also referred to as "sciences", "scientific fields", or "scientific disciplines") are commonly divided into three major groups:

Natural Science: the study of natural phenomena (including fundamental forces and biological life).

Formal Science: the study of mathematics and logic, as opposed to factual methodology).

Social Science: the study of human behaviour and science.

Natural, social, and formal science makes up the fundamental science, which form the basis of interdisciplinary and applied sciences such as engineering and medicine. Specialized scientific disciplines that exist in multiple categories may include parts of other scientific disciplines but often possess their own terminologies and expertise. Natural science is a branch of science that seeks to elucidate the rules that govern the natural world by applying an empirical and scientific method to the study of the universe. The term natural sciences is used to distinguish it from the social science, which apply the scientific method to study human behaviour and social patterns; the humanities, which use a critical or analytical method to the study of the human conditions and the formal science

Physical science

Physical science is an encompassing term for the branches of natural science and science that study non-living systems, in contrast to the life sciences. However, the term "physical"

creates an unintended, somewhat arbitrary distinction, since many branches of physical science also study biological phenomena. There is a difference between physical science and physics.

Physics

Physics is one of the oldest academic disciplines, perhaps the oldest through its inclusion of astronomy. Over the last two millennia, physics was a part of natural philosophy along with chemistry certain branches of mathematics and biology, but during the Scientific Revolution in the 16th century, the natural sciences, emerged as unique research programs in their own right. Certain research areas are interdisciplinary, such as biophysics and quantum chemistry, which means that the boundaries of physics are not rigidly defined. In the nineteenth and twentieth century's physics emerged as a major unifying feature of the philosophy of science as physics provides fundamental explanations for every observed natural phenomenon. New ideas in physics often explain the fundamental mechanisms of other sciences, while opening to new research areas in mathematics and philosophy.

Chemistry

Chemistry is the science of matter and the changes it undergoes. The science of matter is also addressed by physics, but while physics takes a more general and fundamental approach, chemistry is more specialized, being concerned by the composition, behaviour (or reaction), structure, and properties of matter, as well as the changes it undergoes during chemical reactions. It is a physical science which studies various substances, atoms, molecules and matter (especially carbon based); biochemistry, the study of substances found in biological organisms, physical chemistry, the study of chemical processes using physical concepts such as thermodynamics and quantum mechanics, and analytical chemistry, the analysis of material samples to gain an understanding of their chemical composition and structure.

Earth Science

Earth science (also known as geosciences, the geosciences or the Earth sciences) is an all embracing term for the sciences related to the planet earth. It is arguably a special case in planetary science, the Earth being the only known life-bearing planet. There are both reductionist and holistic approaches to Earth sciences. The formal discipline of Earth sciences may include the study of the atmosphere, hydrosphere, oceans and biosphere, as well as the solid earth.

Ecology

Ecology is the scientific study of the relationships that living organism have with each other and with their biotic environment. Topics of interest to ecologists include the composition, distribution, amount (biomass), number, and changing states of organisms within and among ecosystem.

Oceanography

Oceanography, or marine science, is the branch of Earth science that studies the ocean. It covers a wide range of topics, including marine organism and ecosystem dynamics; ocean currents, waves, and geophysical fluid dynamics; plate tectonic and the geology of the sea floor; and fluxes of various chemical substances and physical properties within the ocean and across its boundaries. These diverse topics reflect multiple disciplines that oceanographers blend to further knowledge of the World Ocean and understand ding of processes within it: biology, chemistry, geology, meteorology, and physics as well as geography.

Geology

Geology is the science comprising the study of solid earth the rocks of which it is composed, and the processes by which they change. Geology can also refer generally to the study of the solid features of any celestial body (such as the geology of moon or geology of mars). Geology gives insight into the history of Earth, as it provides the primary evidence for plate tectonic, the evolutionary history of life, and past climates. In modern times, geology is commercially important for minerals and hydrocarbon exploration and exploitation and for evaluating water resources. It is publicly important for the prediction and understanding of natural hazards, the remediation of environmental problems and for providing insights into past climate changes. Geology plays a role in geotechnical engineering and is a major academic discipline.

Meteorology

Meteorology is the interdisciplinary scientific study of the atmosphere. Studies in the field stretch back millennia, though significant progress in meteorology did not occur until the 17th century. The 19th century saw breakthroughs occur after observing networks developed across several countries. After the development of the computer in the latter half of the 20th century, breakthroughs in weather casting were achieved.

Space Science or Astronomy

Space science or Astronomy is the study of everything in outer space. This has sometimes been called astronomy, but recently astronomy has come to be regarded as a division of broader space science, which has grown to include other related fields, such as studying issues related to space travel and space exploration (including space medicine), space archaeology and science performed in outer space.

Life Science

Life science comprises the branches of science that involve the scientific study of living organisms, like plants, animals, and human beings. However, the study of behaviour of organisms, such as practiced in ethnology and psychology, is only included in as much as it involves a clearly biological aspect. While biology remains the centrepiece of life science, technological advances in molecular biology and biotechnology have led to a burgeoning of specializations and new, often interdisciplinary, fields.

Biology

Biology is the branch of natural science concerned with the study of life and living organisms, including their structure, function, growth, origin, evolution, distribution, and taxonomy. Biology is a vast subject containing many subdivisions, topics, and disciplines.

Zoology

Zoology is the branch of biology that relates to the animal kingdom, including the structure, embryology, evolution, classification, habits, and distribution of all animals, both living and extinct.

Human Biology

Human biology is an interdisciplinary academic field of biology, biological anthropology, nutrition and medicine which focuses on humans; it is closely related to primate biology, and a number of other fields.

Botany

Botany, plant science, or plant biology is a branch of biology that involves the scientific study of plant life. Botany covers a wide range of scientific disciplines including structure, growth, reproduction, metabolism, development, diseases, chemical properties, and evolutionary relationships among taxonomic groups. Botany began with early human efforts to identify edible, medicinal and poisonous plants, making it one of the oldest sciences. Today botanists study over 550,000 species of living organisms.

c) Linguistics

Definition, Meaning and Concept of Linguistics

Linguistics is the scientific study of language as a a universal human phenomenon. Linguists investigate the structure of language, its relationship to other systems of communication, the acquisition of first and second languages, language in its social context, the causes and effects of language change, and universal properties of language.

Process of Linguistic

Theoretical linguistics concerns itself with the question of what it means to know a language, to learn a language, and to use a language. Answers to these questions not only provide us with a better understanding of the structure of human languages, but also with an understanding of the properties that define the human language ability. Since language is central to most human activity, questions and answers arising from theoretical developments in linguistics often have significant impact far beyond the limits of the discipline of Linguistics.

Subfields of Linguistic

The following subfields of linguistics play an important role in the curriculum of the Linguistics discipline

Phonetics

The branch of linguistics which studies the characteristics of human speech sounds and provides methods for their description, classification, and transcription. Students will become familiar with the International Phonetic Alphabet, which represents the sounds of any human language. For example, the word "baked" would be transcribed as [bejkt].

Phonology

The branch of linguistics which studies the sound systems and sound patterns of languages. Students will become familiar with the rules that govern how we pronounce words. For example, the 'l' sound in the word "lie" is different than in the word "play" and different again in the word "fall".

Morphology

The branch of linguistics which studies the structure of words. Students will become familiar with the processes of word formation. For example, they will learn why we can produce words like "whiten" and "soften", but not "bluen" or "slowen".

Syntax

The branch of linguistics which studies the structure of sentences. Students will become familiar with the principles governing the way words are combined into sentences. For example, they will learn why sentences like "What did you eat eggs with?" sound fine, but sentences like "What did you eat eggs and?" sound bad.

Semantics

The branch of linguistics devoted to the study of meaning in language. Students will become familiar with the ways in which language is used to convey information. For example, they will learn why the word "himself" in the sentence "The boy's uncle admired himself" can refer only to the uncle and not to the boy.

Historical Linguistics

The branch of linguistics which investigates language change. Students will become familiar with the ways in which a language can change over time. For example, they will learn how the earlier Germanic word "musi" became Modern English "mice."

Language Acquisition

The branch of linguistics which studies how children and adults learn languages. Students will become familiar with the characteristics of first and second language acquisition. For example, they will learn why children produce sentences like "I go to outside."

Linguistics as Interdisciplinary

Linguistics is by nature an interdisciplinary field. By interdisciplinary we mean that it is a field that crosses the boundaries of many academic fields. The discipline has its roots in philosophy and philology, and it interfaces comfortably with anthropology, archaeology, modern languages, psychology, and sociology, to name a few areas. Language is a defining characteristic of human beings. As adults, we have a mental representation of the grammar for the language that we speak. Linguistics is concerned with the characteristics of this mental representation, and with how it is acquired. As a result, linguistic theories of learning and theories of mind interact with those developed in psychology and philosophy. A human language, though, is much more than a mental representation. We use language to communicate in a social context. Therefore, linguistics interacts with the disciplines of sociology and anthropology, which inform us about ways of studying society and culture.

Aside from language structure, other perspectives on language are represented in specialized or interdisciplinary branches as follows,

- Historical Linguistics
- Sociolinguistics
- Psycholinguistics
- Ethno linguistics (Anthropological Linguistics)
- Dialectology
- Computational Linguistics

Psycholinguistics and neurolinguistics

As language is such a central feature of being a human, Linguistics has intellectual connections and overlaps with many other disciplines in the humanities, the social sciences, and the natural sciences. Some of the closest connections are with Philosophy, Literature, Language Pedagogy, Psychology, Sociology, Physics (acoustics), Biology (anatomy, neuroscience), Computer Science, Computer Engineering, Health Sciences (Aphasia, Speech Therapy).

Concepts of knowledge

i) **Firm Knowledge**

1)There must be a real subject of knowing, a knower

2)Knowledge is about something, it must have an object thatnis known

3)The known is represented in some structure as its order. Knowledge exists as a structural order

4)There must be some correspondence between the knowledge and the known. The structural order that carries the knowledge has to be formed in process where the fit between it and its object has increased.

ii)Objective Knowledge

Objectivity is a central philosophical concept, related to reality and truth, which have been variously defined by sources. Generally, objectivity means the state or quality of being true even outside of a subject's individual biases, interpretations, feelings and imaginings. A proposition is generally considered objectively true (to have objective truth) when its truth conditions are met

without biases caused by feelings, ideas, opinions, etc. of a sentient subject. A second, broader meaning of the term refers to the ability in any context to judge fairy, without partiality or external influence. This second meaning of objectivity is sometimes used synonymously with neutrality.

iii)Impersonal Knowledge

Concept of knowledge is independent of any psychological facts about any knower or believer of that piece of knowledge. Because of the objectivity of truth and of logic, it becomes possible to approach knowledge in a non- subjective way, and to treat it as a system of objective or non- subjective way, and to treat it as a system of objective or non- psychological entities. With this approach, knowledge is regarded a consisting of objective contents, which are distinguished from psychological acts, such as believing or knowing, which are directed towards these contents. Several properties and relationships of objective knowledge are contrasted with psychological properties and relationships of subjective knowledge. Doctrines which rest upon the confusion of these two distinct realms are criticized.

iv)Dialogical knowledge

Dialogical knowledge helps in teaching by harnessing the power of talk to stimulate and extent pupils' thinking and advance their learning and understanding"

"... Knowledge is dialogical in as much about the teacher as the learner, and relates to teaching across the curriculum"

Dialogical teaching and learning stems from the following principles:

1)Knowledge isn't fixed

It means different things to different people in different times and places

2) The dialogue between these different perspectives leads to new understands and new knowledge

3)Teachers and students can become more fully engaged in learning in an environment where these differences are respected and rigorously explored

4)Such exploration, where meanings are constructed from the inside by learners in dialogue, rather than imposed from the outside, leads to powerful learning

5)Learning through dialogue leads not only to content knowledge but improved thinking skills

V)Subjective knowledge

The subjective view of knowledge and understanding might be contrasted with the objective, realist view. In this view there are such things as matter, physical objects, space and time, other people etc. Things happen and casually interact, largely independent of observers. Occasionally we experience something subjectively, but later determine that id did not really, objectively happen. For example, we experience something subjectively, but later determine that it did not really, objectively happen. For example, we felt room get hot, but the thermometer registered no change. In this view there is a reality independent of our experience. This would be easy to deny if there was only one agent in the world. In that case it clears that agent is merely inventing things to explain its experience. The objective view gains much of its force because it can be shared by different people. In science, this is almost the definition of the subjective/ objective distinction: that which is private to one person is subjective whereas that which can be observed by many, and replicated by others, is objective.

The appeal of the subjective is that in grounded. Subjective experience can be viewed as data in need of explanation. There is a sense in which only the subjective is clear and unambiguous, “whatever it means, I definitely felt warn in that room.”No one can argue without subjective experience, only with its explanation and relationship to other experiences that we have or might have. The closer the subjective is inspected, the firmer and less interpreted it appears, the more is becomes like data, whereas the objective often becomes vaguer and more complex. Consider the old saw green, and vice versa, but didn’t realize it because he used the words “red” and “green” the wrong way around as well. This nonsense points out the different people’s subjective experiences are not comparable. The experience that I call seeing red and the experience you call seeing red are related only in a very complicated way including, for example, efforts of lighting, reflectance, viewpoint, and colored glasses. We have learned to use

the same word to capture an important aspect of our separate experience, but ultimately the objective must bow to the subjective.

Fluid and Porous Frame of knowledge

The above figure shows the relationship between curriculum and its broad socio-political context, which in our view, must be accounted for and understood by critical multicultural educators. From our shared perspectives' of an LLC framework (Language, Literacy and Culture) we view curriculum as the result of the tension between various workers at the centre of the diagram- namely by teachers, students, and the communities of which they are part. The largest area represents the context of education and curriculum and includes culture, particularly, the languages in which, the literary practices through which education occurs.

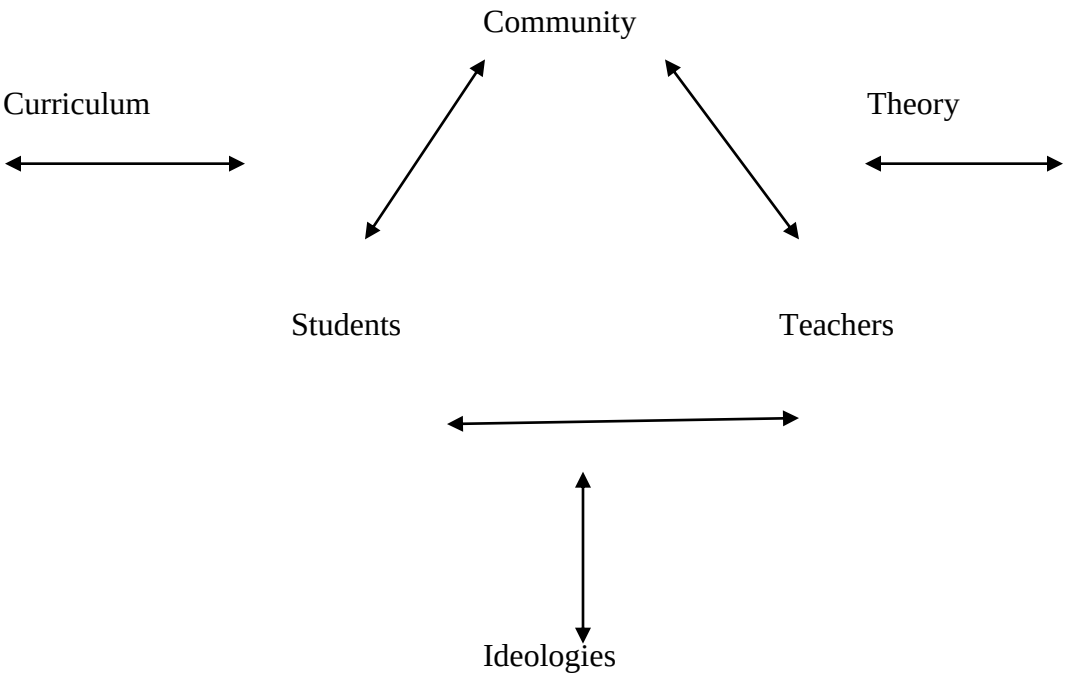


Figure: The Socio-cultural Context of Curriculum from a Critical LLC Perspective

Through their curriculum, pedagogical and evaluative activities on day to day life in classroom, schools play a significant role in preferring if not generating... inequalities (Apple, 2004).Despite its strong theoretical grounding, the application of multicultural education had

tended to relay on narrow notions of curriculum, instruction, culture and community. As a result, in cultural school's curriculum has frequently been reduced to discrete lessons on distinct on static culture and instructional practices have focused on specific strategies rather than overall approach. While multicultural educators and scholars continue to challenge and push these well intentioned but followed understandings of class, we propose that multicultural educators must also reconsider the very ways we have come to talk about identify power and inequality.

Multicultural education, viewed comprehensively and critically, is a persistent reminder to educators and researchers that we cannot leave the marginalized, the most vulnerable, and the most improvised of our students languishing while theorists toss around heady semantics that take no action towards social change. Likewise, postmodernism with its focus on questioning boundaries and disarming grand narratives reminder multicultural educators that identities and cultural instructs are fluid and porous and that relationships to knowledge and truth are unstable.

REDEFINITIONS OF SCHOOL SUBJECT FROM SOCIO-CULTURAL PERSPECTIVES

Psychologists use many different approaches that work together to understand and explain human behaviour. The sociocultural perspective is one approach to understanding why humans behave the way they do. The sociocultural perspective seeks to understand human behaviour and personality development by examining the rules of the social groups and subgroups in which the individual is a member. These rules are often unwritten guidelines that direct a person's actions.

- Groups can affect behaviour
- Examining cultural differences

Social justice

Historically, classrooms have been the stage for social change, providing a venue to promote and accelerate new ideas. In addition to academic instruction, one of a classroom teacher's most important roles is to help students develop the critical thinking, collaboration and self-reflection skills necessary to foster a better society.

Goal of social justice

Social justice doesn't manifest in a singular fashion, nor is it achieved through a specific means of instruction. Students studying this field use critical examination of themselves, others, institutions and events to find patterns of inequality, bigotry or discrimination, then explore possible solutions to the problems they've identified. Social justice advocates hope to build a society in which individuals have equal access to resources and receive equitable treatment regardless of their race, gender, religion, sexuality, income level or disability. Enabling conversations about these issues empowers students to voice their concern and question unjust situations in their lives or in the lives of those around them.

Philosophy of social justice to the classroom

In "Rethinking Our Classrooms" ,Wayne Au , Bill Bigelow nd Stan Karp write that "classrooms can be places of hope, where students and teachers gain glimpses of the kind of society we could live in and where students learn the academic and critical skills needed to make it a reality".

However, classrooms can also shut down that conversation, whether it's in order to prepare for standardized tests, through a lack of discussion time, or because a teacher simply doesn't understand or value cultural competency. In order to foster classroom social justice, teachers must first build a safe, encouraging place where students can speak about their experiences and beliefs.

Social justice in the real World: Classroom discussions that help students critically engage with issues

Once teachers are able to foster a learning environment that enables thoughtful discussions with a variety of opinions and perspectives, they can facilitate conversations about real-world issues that affect students' everyday lives. Students need to be able to recognize real-world problems and critically engage with these issues.

Racism and Social justice

Racism in the United States has been the focus in several high-profile incidents of violence against people of colour. As students explore issues racism in their own lives, they need to be able to bring up these issues in class discussions. They also need to be able to recognize ways racism masquerades as normal treatment and question this treatment.

Bullying, friendship and dating behaviour

While young people are fairly adept at recognizing overt bullying in the form of assault, name-calling and online harassment, they might not be aware of the other ways that bullying can manifest. Students should be taught about the harm done by smaller behaviours that are often normalized as a part of the adolescent experience.

It's important that students recognize this behaviour both in their own actions and those of peers. Examples include groups of girls who exclude or mistreat one member, boys who prove their masculinity by dominating and controlling others, or anyone who bullies a peer due to their declared or perceived gender or sexuality.

Students should also learn they have a right to healthy romantic relationships. To do so, they must understand issues of consent and be able to tell the difference between positive dating behaviour and the use of coercion, humiliation or other forms of abuse.

Turning social justice learning into community service and action

Once students are able to recognize and discuss social injustice, teachers can help them act upon the issues they see. Teachers can use service learning projects to connect their classroom to the surrounding community. Through long- and short-term projects, students can meet specific needs by participating in book and food drives, gardening or park care or mentoring at-risk students.

Social justice classes can also use activist strategies such as social media campaigns, demonstrations and teach-ins to raise awareness of an issue and build support for positive change. Teachers can connect engagement in these activities to writing assignments that enable students to reflect upon how their actions have the potential to evoke social change.

Ultimately, social justice can't be taught in one easy lesson. It is a value that gets integrated into the teaching philosophies and actions of teachers. By helping students feel safe and encouraged, teachers can help students start asking the right question and then participate in ways that are purposeful and productive.

Creating classrooms for social Justice

Social justice is recognizing and acting upon the power that we have for making positive change. Teachers do this every day in many ways. And, in order to take that idea to the next level, teachers might include classroom practices that will make this dynamic explicit. It's a good idea to give students opportunities for seeing how positive change happens and how they can be both actors and leaders in creating change.

It is also important to note that many of the practices that demonstrate a social justice orientation are also reflective of best practices in teaching. Social justice is not an,"add on" for the classrooms. This is a booth/ and proposition. Teachers can both maintain high-quality content instruction and create a classroom with a social justice orientation. Also, a social justice orientation is appropriate for all classrooms. This isn't something that just gets done in diverse classrooms, or classrooms that lack diversity, or urban classrooms-or any other special category of school. It is a way of teaching and being that supports high-level thinking and learning throughout our lives.

Creating classroom community

Create opportunities for student's voices to be heared. They need to be taught how to participate in discussion. As teachers, we can encourage both sharing one's own ideas and responding to the ideas of classmates. The teacher's role is to use questioning that can help students make connections between the big ideas that inform the lesson content

Classroom can also provide time for collaboration toward a common goal. Teach students to be "academic siblings". We all know that sometimes siblings get on each other's nerves, but ultimately you know that you can count on your siblings to have your back, be honest with you, and support you.

Also, teachers can take a critical look at the materials in the classroom. Do the books, stories, and other curricular materials present one specific narrative? If they do, revamp what you have to be sure that your materials include examples from diverse aspects of society, including ethnicity, religion, language, gender, ability, sexual orientation, and socio-economic status in a non- stereotypical manner.

School Subjects and Social Justice

Once students are able to recognize and discuss social injustice, teachers can help them act upon the issues they see. Teachers, ir-respective of the subjects they teach, can use service learning projects to connect their classroom though the surrounding community. Through long- and short-term projects, students can meet specific needs by participating in book and food drives, gardening or participating in book and food drives, gardening or park care, or mentoring at risk students.

Teachers can also use activist strategies such as social media campaigns, demonstrations and teach-ins to raise awareness of an issue and build support for positive change. Teachers can

connect engagement in these activities to writing assignments that enable students to reflect upon how their actions have the potential to evoke social change.

Ultimately, social justice can't be taught in one easy lesson. It is a value that gets integrated into the teaching philosophies and actions of teachers. By helping students feel safe and encourage, teachers can help students start asking the right questions and then participate in ways that are purposeful and productive.

UNIT III

DISCIPLINARY KNOWLEDGE ANDSCHOOL EDUCATION

Introduction

Knowledge pertaining to a particular field of study constitutes the basis of discipline. Basic concepts, principles, laws and theories deduced from that discipline constitutes the contents for the subject of a school curriculum. A good teacher needs to understand not only the contents of the school subjects he/she is teaching, but also the developments and the philosophy of those subjects. Having this in mind, this unit discusses the disciplinary knowledge of teaching school subjects and their pedagogical concerns. A school curriculum not only deals with core disciplines and subjects but also deals with many other areas specific knowledge such as Arts and Crafts. Work Education, Peace Education. Health and Physical Education, Value Education etc. But specific areas these of knowledge are not given the same importance as that given to the core school Subjects. This unit deals with these issues as well as the 'Need for Reframing School Subjects and 'Recent Development in School Subjects'.

Disciplinary Knowledge and Pedagogical Approaches in School Subjects

A teacher should understand both the disciplinary knowledge and the pedagogical practices. Disciplinary Knowledge need to be integrated systematically in curriculum at different stages of school education. Pedagogical knowledge includes an understanding of what makes the learning of Specific topics easy or difficult.

The current pedagogical practices in school education are contextualised in the light of the needs of the learners. National Curriculum Frame Work for Teacher Education(NCFTE, 2009) advocates shifting the focus from pure disciplinary knowledge and pedagogical practices; Instead, disciplinary knowledge and pedagogical practices are to be integrated a every stage of school education. In other words in each school subject, the different concepts of disciplinary knowledge to be included in the school curriculum and what pedagogical approaches are to be used for transacting those concepts of disciplinary knowledge are identified and mentioned in the curriculum frame work i.e. pedagogical approaches to be used for teaching different segments of disciplinary knowledge at different stages of school education, are to be clearly spelt out in the Curriculum.

Disciplinary, Knowledge

We have already discussed definition the meaning and concept of 'discipline'.

The knowledge pertaining to a particular academic area forms the basis of discipline. The academic knowledge deduced from that discipline constitutes the contents for the subject of a school curriculum.

Now let us list the characteristics of 'discipline' from the definition given to it.

i) It is a recognized area or field of study.

ii) It has a substantial body of knowledge founded on core concepts and theories.

iii) It has critical inquiry methods for studying problems.

iv) It has a definite scope for research.

v) It has significant contributors of knowledge, research and practices within a discipline.

vi) It is associated with learned societies and academic organisations.

vii) It has its own intellectual history.

viii) Scholars continue their interest in studying the discipline in the advanced stage.

Important Pedagogical Approaches and their Implications for Teaching and Learning

The three major pedagogical approaches that find place in teaching school subjects are

i) Behaviourist Approach
ii) Coginitivist Approach
iii) Social Constructivist Approach

Behaviourist Approach in Pedagogy

The central concept of this approach is modification of behaviour occurs when bonds are established between stimulus and response and this modification of behaviour constitutes learning. I**.Paviov, E.L. Thorndike, J.B. Watson and B.F. Skinner** are the exponents of this approach.

Implications of this approach for Teaching Learning process are :

i) Emphasis on producing observable and measurable learning outcomes in students.
ii) Pre-assessment of learners to decide from where instruction should start.
iii) Emphasis on mastering simple early steps before progressing to more complex levels of performance.
iv) Use of. reinforcement to favourably influencing learning.
v) Use of cues, shaping and repeated practice (drill) to ensure a strong stimulus – response bond.

Cognitivist Approach in Pedagogy

Cognitive theories focus on how information is received, organized, stored and retrieved by the mind. It assumes human brain has network Of nerves, by operating which, it makes it possible to perform complex cognitive tasks, facilitating human learning. An understanding of how cognitive tasks are accomplished by brain and how mind mediates in performing those tasks, helps the teachers develop unique teaching-learning tools for children.

Alfred Adler, Gordon Allport, Erik Erikson, Hans Eysenck, Sigmund Freud, Karl Jung. Jean Piaget, Carl Rogers etc. are the advocates of the cognitive approach in pedagogy.

Implications of this approach for teaching learning process are

i) Emphasis on the active participation of the learner in the teaching-learning process.

ii) Use of hierarchical analysis to identify and illustrate pre-requisite relationships.

iii) Emphasis on structuring, organising and sequencing information to facilitate optimal processing of the information provided children.

iv) Creation of learning environments that allow students to make connections with previously learned materials.

V) Giving importance for discovery learning.

Social Constructivist Approach in Pedagogy

Social constructivist assumes that a child is an active constructor of his/her own knowledge. Teachers help students to construct their knowledge by using their vast experience. Children cannot be coaxed to learn but to be motivated by meaningful participation in the classroom discourse. The classroom teaching should encourage students to ask questions, investigate and inquire individually and collectively the questions before them and reflect on their own solutions individually. The teacher's role will be that of a collaborator of mutual Construction of meaning and not a dictator of meaning. Textbooks play the role of meditational tool for Knowledge Construction.

John Dewey, Jean Plaget, Jerome Bruno and Lev Vygotsky are the proponents of Social Constructivist approach in Pedagogy.

Implications of this approach in the teaching learning process are :

i) Developing a classroom discourse around the concept using children's own experiences and knowledge at the beginning.
ii) Creating multiple contact points for children with the classroom discourse. Taking the help of textbook, children's own experience and innovative teaching to create these contact points.
iii) The need for information to be presented in a variety of ways so that children find multiple scaffold to their learning.

iv) Supporting the use of problem-solving skills that allow learners go beyond the information given and develop critical learning tools for themselves.

v) Assessment focusses on multiple ways through which the knowledge can be constructed and contested.

vi) Use of teaching that develops reflective thinking in students.

The above three pedagogical approaches need to be taken into account to select the content of the curriculum for different stages of school education. The National Curriculum Framework (NFC) 2005 & NCFTE of 2009 emphasize the use of constructivist approach of pedagogy in school education.

Disciplinary Knowledge and Pedagogical Approaches in School Subjects

The disciplinary knowledge of the subjects taught at the school level with specific pedagogical approaches required to transact the same knowledge, are presented briefly in the following table.

School subjects	Disciplinary knowledge	Pedagogical Approaches
	❖ Citizenship education ❖ Reflective socio-political enquiry ❖ Informed social criticism and ethical decision making to social issues ❖ Social dynamism, mobility and transformation ❖ Believe in constitution values like democracy, justice, and equality ❖ Personal engagement and development ❖ Culture – Local, National, and Global ❖ People, place, and environment ❖ Individual development and identity ❖ Individuals, groups, and Institutions	❖ Reflecting on one's own experience of various social and political situations ❖ Observing various social and political situations and engaging in critical political inquiry ❖ Case analysis of individuals and institutions ❖ Filed visit to places of historical, social, and political importance ❖ Classroom debate and discussion on concepts and ideas ❖ Peer and group interaction ❖ Individual and group projects and

	❖ Power, authority, and governance ❖ Production, distribution, and society ❖ Science, technology, and society ❖ Global connections ❖ Civic ideas and practices ❖ Social research and innovations	assignments ❖ Use of portfolios and maintaining rubrics for assessments
Science	❖ Scientific literacy ❖ Science in everyday situations ❖ Understanding the world around the learners ❖ Socio-scientific issues ❖ Sources in and outside schooling ❖ Science as a way of knowing, thinking, and acting ❖ Matters in our surroundings ❖ Atoms and Molecules ❖ Diversities in living organism ❖ Forces and laws of motion ❖ Work and energy ❖ Natural resources and its management ❖ Improvement in food resources ❖ Acid and chemical reactions ❖ Metals and non-metals ❖ Life processes ❖ How do organisms produce? ❖ Heredity and evolution ❖ Electricity	❖ Scientific inquiry to understand every day experiences ❖ Observation, discovery and experimentation ❖ Repeating classic experiments in Science and discussing how inventors encountered novel scientific ideas ❖ Engagement in the scientific discourse ❖ Contestation, investigation, and evidence based conclusions ❖ Peer and group works on scientific concepts, ideas and methods ❖ Scientific quiz and workshop ❖ Visiting science labs located in institutions of higher learning

	❖ Scientific research and innovations	
Language	❖ Socio-cultural issues in language learning ❖ Construction of language knowledge during the early years of life ❖ Age wise language development ❖ Multilinguality and language learning ❖ Differences between school and home language ❖ Usages of languages ❖ Language development and cognitive skills ❖ Language usages in diverse social households ❖ Development of languages ❖ Skills development in language learning – speaking, listening, writing, reading ❖ Teaching various texts of languages – drama/fiction, grammar, poetry, prose, narratives, etc. ❖ Creation and appreciation of language and literatures ❖ Multi and cross cultural issues of languages ❖ Language research and current practices	❖ Use of communicative approach ❖ Use of narratives and storytelling ❖ Peer and group discussions and debates of academic and language issues ❖ Engaging learners in developing language acquisition skills ❖ Sensitizing the learners to appreciate language creations and create their own literature ❖ Finding out the gap between language usage at home and school ❖ Using free response formats that allow for open ended and creative answers ❖ Individual and group feedback and assessment

The above table hightlights the different pedagogical approaches for transacting disciplinary knowledge at School level. The pedagogical approaches mentioned in the third

column of the table emphasizes child-centred learning and teacher's role in the whole process is that of a facilitator.

Pedagogical Concerns of Disciplinary Knowledge at Different Stages of School Education

In the previous section the general pedagogical approaches for transacting disciplinary knowledge at the school stage have been discussed. Now let us discuss in this section the specific pedagogical approaches that can be used for transacting disciplinary Knowledge as part of teaching-learning process at different stages of school education and the following table depicts the same.

Stages of School Education	**Subject Areas**	**Specific Pedagogical Approaches for transacting disciplinary knowledge**
Elementary	Language	• Interactive, participatory, and collaborative methods • Use of narratives • Dealing with textual exercises • Listening and producing oral discourses • Interpreting tables, graphs, diagrams, pictures, etc. • Reviewing content of Book/article • Writing discourses and editing • Use of dictionary, encyclopedia, and internet • Theme based brainstorming • Use of concept mapping • Audi-lingual method, communicative approach, teaching diverse classroom – addressing sociopsychological factors of language learning • Conducting seminars, workshops for preparation of materials • Linking reading and writing • Using literature across the curriculum
	Social Science	• Issue based dialogue, debate and discussions

		• Discovery, project, problem solving, narration, comparisons, observation dramatization, and role play • Utilization of the resources like; audio-visual materials, photographs, charts, maps, replicas of archaeological and material culture • Practice of process skills – observations, classifications, questioning, framing hypothesis, data analysis, drawing inferences, interpretation of results, reporting, etc. • Map reading, cartoon analysis, writing slogans, etc. • Conducting inquiry – discussion, field work, peer and group activities, surveys, etc. • Interactive, participatory, and collaborative methods
	Science	• Conduct of activities and experiments, observation, classification, inferences, discussion, conducting inquiry, discovery, projects, etc. • Science-museum, filed-trips, projects and exhibitions • Probing, documenting and analyzing children's ideas • Science and society interface • Survey, organization and presentation of data • Use of concept map, peer and group learning, collaborative learning • Engaging in joyful learning
	Mathematics	• Inductive and deductive, problem solving • Preparing mathematical models • Use of concept map to understand Mathematics • Interactive, collaborative, and participatory methods • Understanding two and three dimensional shapes • Analysis and synthesis, puzzles, play, mathematical

		games, analyzing time-table, time-line, data handling, etc. • Representation and interpretation of mathematical calculations • Development of spatial reasoning and visualization skills
Secondary	Language(s)	• Addressing multilingualism • Gaps between home and school languages • Classroom discourses – Questioning, discussion, debates, elocution, brain-storming, communication, dramatization, role play, language games, etc. • Analyzing texts –expository vs. narrative, transactional vs. reflective • Note-making, summarizing, connecting reading-writing, process of writing, writing to learn and understand • Analyzing texts across the curriculum • Flow of communication in schools and the society
	Social Science	• Enquiry-based and problem-based learning • Methods of teaching – Source, field study, folk lore, oral history, balpanchyat, mock parliament. Project, story telling, exhibition, peer and group discussion, etc. • Visit to Historical, ecological, commercial, and political places • Organising awareness and other important activities Environment, social, election, blood donation, etc.
	Science	• Use of science process skills • Understanding science and society • Enquiry and problem-based learning

		• Use of integrated, ecological, inductive, deductive, problem-solving, and constructivist approaches to learning • Use of lecture, discussion, debates, demonstration, field trips, individual peer and group presentation, experimentation, scientific discovery, etc.
	Mathematics	• Mathematical modeling, data analysis and interpretation, content analysis in Mathematics • Exploring connections and patterns, visualization and generalization • Problem-solving, induction-deduction, analysis-synthesis, project, demonstration, Mathematical activities, Use of Mathematical laboratories, etc.

The above table shows 'specific' pedagogical approaches for teaching subjects at the elementary and secondary stages of education Now it is clear that the pedagogical approaches for transacting discipli-nary knowledge at different stages of school education are based on learner-centred approach to learning.

Classifying and Accomodating Specific Areas of Knowledge

School curriculum usually consists of subject contents drawn from the core disciplines like Languages, Social Science, Science, Mathematics etc. Hence many are as of knowledge which are also important, such as Art andCraft Education,Work Education. Life Skills Education, Value Education, Sports and Physical Education can not be incorporated in school education as separate subjects as they are not treated as disciplines like Languages, Social Science, Science and Mathematics. As a result those important areas of knowledge become side-lined and often labelled as 'Extra-curricular' or 'Co-curricular' area of study, instead of being an integral part of the Curriculum.

Core Disciplinary Areas of Knowledge

Our school curriculum usually includes the core subjects of study i.e. Languages, Social Science, Science and Mathematics. We could find that these core subjects of study find place in the curriculum for different stages of school education with different nomenclatures. The following table illustrates this :

Stages of School Education		**Subject Areas**	**Presented in School Curriculum**
Elementary (I-VIII)	Lower Primary (I-V)	Languages	Mother Tongue, Regional Languages, Hindi, English
		Social Science Science	Environmental Studies (EVS), that includes the themes/topics of both Science and Social Science
		Mathematics	Mathematics as independent subject of study
	Upper Primary (VI-VIII)	Languages	Mother Tongue, Regional Languages, Hindi, English
		Social Science	Study of History, Political Science and Geography under the subject area of Social Science.
		Science	Study of Physical and Natural sciences under the subject area of Science.
		Mathematics	Mathematics as an independent subject of study
Secondary (IX-X)		Languages	Mother Tongue, Regional Languages, Hindi, English
		Social Science	History, Political Science, Geography and Economics under the subject area of Social Science.
		Science	Physical and Natural sciences under the subject area of Science.
		Mathematics	Mathematics as an independent subject of study

Senior Secondary (XI-XII)	Streams	Languages	Studies as Compulsory subjects
	Arts and Humanities	History, Geograhy, Economics, Political Science, Sociology, Psychology, Languages etc.	Different branches of Arts and Humanities stream, treated as elective areas of study.
	Science	Physics, Chemistry, Mathematics, Botany, Zoology, etc.	Different branches of Science stream, treated as elective areas of study.
	Commerce	Accounting, Business, Studies, Marketing, Finance, Insurance etc.	Different branches of Commerce stream, treated as elective areas of study. Subject Areas Presented in School Curriculum

Specific Non-Core Areas of Knowledge in the Curriculum

Art and Craft

Though debates for the inclusion of 'Art and Craft Education' in school curriculum have be going on for years, so far nothing has taken place in this regard. Even if it gets included in the school curriculum, it is kept out of the core subject areas. Art and Craft education is important for school children as they develop sense of creativity, aesthetics appreciation and skills. Though

there is scope for career and jobs in art and craft at the higher stages of education, yet they are not integrated in school curriculum.

Work Education

Work finds a part in everyone's life. Children need to be prepared for the world of work and as such work education should be included in the school curriculum. The inclusion of 'Socially Useful and Productive Work' (SUPW) in school curriculum makes the children self-disciplined, self-controlled and emotionally balanced, yet SUPW of the present the day school curriculum hardly achieves its objectives. It should be well integrated with the disciplinary knowledge of the school curriculum.

Peace Education

We live in an age of unprecedented levels of violence, with constant threats posed by intolerance, fanaticism, dispute and discordance in our society. Hence, it is utmost necessity to train Our children and youth to practice tolerance, justice, inter-cultural understanding, civic responsibility and peace both at home and in the workplace. The school is the primary agent to achieve these by including 'Education for Peace' in its curriculum. It seeks to nurture ethical development inculcating the values, attitudes and skills required for living in harmony with oneself and with others, including nature. to we go through the present day school curriculum, we find that very small contents are included, which addresses the issues of peace education with a few topics and subjects. Peace education should be integrated with the subject contents across the subjects of the school curriculum in various forms like stories, narrations, interactions, activities etc.

Life Skills Education

Life skills education has been neglected in the present day school curriculum. The real aim of education is not only to provide students with disciplinary knowledge but also acquaint them with life skills and values. Nurturing "Life Skills" includes developing improved self-esteem, empathy towards others and different cultures, improving on their critical and creative thinking, developing problem-solving and decision making skills. The core life-skills must be integral to the whole process of education (CBSE, 2015).

Now in the present scho0 curriculum, it is limited to conducting a few activities and including them in students' report Cards. Further, it is also difficult to assess students' attainment of life skills as they require qualitative assessment. But the real challenge is how to integrate life-skills education in the school Curriculum. There is the need for including core life skills in the various subjects of the school Curriculum i.e. life-skills education should be an integral part of the core curriculum.

Health and Physical Education

Health is a critical input for the overall development of the child and it influences enrolment, retention and school completion rates significantly. The holistic definition of health includes physical education and yoga which contribute to physical, social, emotional and mental development of child.

The idea of a comprehensive school health programme, conceived in the 1940s includes six major components viz. medical care, hygienic School environment and school lunch, health and physical education. These components are important for the overall development of the child and hence need to be included in the curriculum at all levels of schooling. Yoga' the more recent addition to health and physical education is also important and need to be part of the core Curriculum. Time for yoga, games and sports in school curriculum must not be reduced, rather enhanced.

Value Education

“The aims of education are landscapped in the guiding principles of our Constitution which reflect a commitment to democracy and the values of equality, justice, freedom, concern for others' well-being, secularism, respect for human dignity and human rights. Education should aim to inculcate these values, which are based on reason and understanding. The curriculum, therefore should provide adequate experience and space or dialogue and discourse in the school to promote such a "commitment in children" (CBSE, 2015-16). Almost all the education committees and commissions have recommended for inclusion of value education

in curriculum, especially at the school level. TheCentral Board of Secondary Education (CBSE) as well as State Boards of School Education have tried to incorporate constitutional other

personal' and social values in their curriculum, but still they seem to be inadequate in the curriculum. There is the need for the integration of constitutional and other values across the subjects in the curriculum at all levels of school education.

Need for Reframing School Subjects

Academic disciplines and school subjects continue to evolve giving rise to new disciplines and school subjects. For example the new areas of study i.e. 'Bio-Physics' , 'Bio-Chemistry', Bio Informatics', 'Microbiology', 'Bio-technology', "Bio-Engineering' etc. emerged from the parent discipline 'Biology'. 'Nano-Technology', 'Astro Physics', 'Electronics', etc. have emerged from the parent discipline 'Physics'. 'Computer Science', 'Information and Communication Technology' etc. have emerged from the parent discipline 'Mathematics.

Further many new subjects have also emerged from the cross and multi-disciplinary areas of studies. Eg. 'Robotics', 'Artificial Intelligence', 'Mechatronics', Big Data Analysis'. 'Bio-Instrumentation' etc. Hence, the emergence of new area of knowledge demand the reframing of subjects of study.

When the Government require its citizens to acquire certain type of knowledge, it ensures that the same knowledge is taught at the school and included in the school curriculum. For example, as Indian Government wanted its citizens to acquire the knowledge of 'Yoga', it got included in the school curriculum. Yoga and Health Education' has been now made a component compulsory of study at the school and teachereducation institutions.

Apart from the above two factors viz. emergence of newareas of knowledge and the government initiative to include certain subjects to broaden the curriculum to meet the political, social and educational needs of the country, the other factors contributing to the reframing of curriculum are listed below:

i) Scope for higher education, employment opportunities and demands in the global market.
ii) Change in pedagogical practices and approaches (Eg. India recently adopted 'on line' classes even for primary school students).
iii) Skills development, inculcation, values, community living etc.

iv) Academic disciplines giving birth to new subjects and new topics emerging from existing subjects.

Recent Developments in School Subjects

Contents of school subjects viz. Social science, Science, Language and Mathematics of the CBSE curriculum were recently updated to accommodate the recently emerged topics and enriched, apart from linking it with everyday life, the details of which are provided here under :

Science

- Scientific literacy
- Science in everyday situations
- Understanding the world around the learners
- Socio-scientific issues
- Sources in and outside schooling
- Science as a way of knowing, thinking, and acting
- Matters in our surroundings.
- Atoms and Molecules
- Diversities in living organism
- Disciplinary Knowledge and School Education
- Forces and laws of motion
- Work, power and energy
- Natural resources and its management
- Improvement in food resources
- Acids and chemical reactions
- Metals and non-metals
- Life processes
- How do organisms produce?
- Heredity and evolution
- Electricity
- Scientific research and innovations

Social Science:

- Citizenship education
- Reflective socio-political enquiry
- Informed social criticism and ethical decision making to social issues
- Social dynamism, mobility and transformation
- Constitutional values like democracy, justice and equality
- Personal engagement and development
- Culture - Local, National, and Global
- People, place, and environment
- Individual development and identity
- Individuals, groups, and Institutions
- Power, authority, and governance
- Production, distribution, and society
- Science, technology, and society
- Global connections
- Civic ideas and practices
- Social research and innovations

Math

Numbers, four simplification, basic operations, money, metric System, reading clock, basic Geometrical concepts.

Number Fractions, decimal fraction, Money, measurement, ldea of simple Geometric term/concept/properties Unitary method, simple interest, Ratio and proportion.

General Mathematics : Number system, Sets (basic ideas) Algebra- expression, equations, factors, Geometry Mensuration – theorem, properties, Discount, Shares Graphs, Compound interest, Banking Introduction to Trigonometry, Statistics, Advance Mathematics consists of: Sets, Fraction, Irrational number, complex number, Indices and logarithm, Inequality and in equation, Quadratic equation, Geometry proofs and application.

Languages

- Skills development in language learning speaking, listening, writing, reading
- Teaching various texts of languages- drama/grammar, poetry, prose, narratives, etc.
- Creation and appreciation of language and literatures
- Multi and cross-cultural issues of languages
- Language research and current practices
- Socio-cultural issues in language learning
- Construction of language knowledge during the early years of life
- Age wise language development.
- Multilingualism and language learning.
- Differences between school and home language
- Usages of languages
- Language development and cognitive skills
- Language usages in diverse social households
- Development of languages
- Disciplinary Knowledge and School Education

Physical Education

- Human Body
- Movement and awareness
- Food and Nutrition
- Safety and Security
- Our environment
- Social health and Sports services
- Sports skills and abilities
- Physical fitness
- Orientation to sports skills
- Orientation to physical education and sports education.

Fine Arts Education

- Art education programme should comprise, handling of the materials for drawing, painting, collage, clay modeling an construction of puppets; creating artistic things by free expression method, learn simple concepts of visual arts, knowledge of work of well-known artists both contemporary as well as historical etc. prepare posters, placards and invitation cards related to celebrations of national days like Republic Day, Independence Day, etc.
- Drawing, painting and sculpture / clay modeling
- Activities of dance, music, drama and craft
- Drawing : contour line, rendering, sketching, value, shading, hatching, crosshatching stippling, one-point perspective.
- Painting : wet-on-wet, wet-on-dry, sponge, wash, water colour, techniques of frottage (rubbing).
- Ceramics : pinch and pulled forms, slau: drape mold, coil, surface decoration techniques
- Sculpture /architecture : carving, additive,subtractive, modelling, constructing
- Fibres : pulling threads, weaving, stitchery, typing and wrapping techniques, braiding, basketry
- Mixed media : collage, bas-relief
- Two Dimensional or Pictorial arts: Drawing and Painting • Collage making, Print making Photography and computer Graphics (Wherever possible)•Rangoli/ Mandna /Wall painting (State / region specific traditional art forms)
- Three Dimensional Arts Sculpture (using locally available materials) • Clay modeling •Terracotta • Carving and relief work •Paper Mache Mask making • Construction (using waste materials) • Pottery (If possible)

• Installation

Peace Education

- Peace concepts and Concerns: Knowing peace, choosing peace, facts about barriers of peace, building blocks of peace: peace within self, Peace at different levels Harmony with nature.

- Understanding and dealing with conflict sources of conflicts, analysing conflicts, dealing with conflicts constructively, related strategies and skills.
- Humanism : living with human relationships, understanding the concept of 'being human'. Setting the goals of life with humanist philosophy, strategies to achieve the goals; Creating a human atmosphere.
- Towards understanding and enabling self; the self and others, overcoming biases and prejudices, Self-reflection and listening to the inner voice.

Value Education

- Values, need to have a value-based life, developing universal human values.
- Values derived from the Indian Constitution
- Developing problem solving attitude towards contemporary challenges, holistic development of the individual, responsible attitude towards self and society, nurturing ethical approach, collaborative skills and respect for human rights.
- Positive thinking, compassion, discovering inner peace, learning to live together, respecting human dignity, being true self, critical thinking, resolving conflict non violently, building peace in the community and caring for the planet.

As seen above, the secondary school Curriculum contains contents of subjects drawn from disciplinary knowledge as well as non disciplinary specific areas of knowledge, thus making the curriculum well balanced, promoting all round development of pupils. Further the Contents are well integrated with the related areas of knowledge which removes Compartmentalisa- tion of knowledge. Further to promote better understanding of the contents of the subjects, the process viz. pedagogical methods and activities are also mentioned against each topic of every unit in all the school subjects, the details of which are presented below.

Processes of Science :

- Critical observation of the natural phenomenon.
- Developing inquiry On observable phenomenon.
- Establishing linking and correlating the scientific ideas' with physical happenings.
- Engaging in scientific experimentation.

- Natural and scientific exploration of facts and ideas and their validation.
- Validating the result of scientific inquiry.
- Developing scientific thinking and ability make abstract concepts/ideas

Processes of Social Science:

- Critical observation of the social phenomenon, like social happenings; norms of the society; inter-personal relationships; issues pertaining to the society; changes and dynamics of the society; diversities and inclusiveness; understanding gender, caste and class, culture and religion; etc.
- Engaging in social inquiry, exploration, and understanding cross cultural and cross sectional dimensions of the society.
- Understanding social, cultural, and economic diversities of the society.
- Understanding individual's rights and duties.
- Understanding civic responsibilities, ethical practices, and love for the entire world

Processes of Math

- Connecting mathematical principles with the daily life of the children.
- Making children think rationally, and do things inductively or deductively.
- Developing logical reasoning and make the children to solve mathematical problems.
- Developing the skills of analyzing synthesizing the mathematical principles.

Processes of Language

- Making the children communicate themselves in different situations.
- Developing the skills of listening, speaking, reading and writing.
- Understanding and reflecting on literature.
- Appreciating literature and engaging in creating literature
- Linking similar literatures and also developing metacognitive skills

Putting in a nutshell, the recent development In the subjects of secondary school curriculum Disciplinary Knowledge and School Education that subject contents are well integrated and the

pedagogical process for each concept of the subject content is also mentioned so as to make the teaching - learning process well defined and appropriate.

UNIT -IV

LEARNER-ORIENTED CURRICULUM

Concept and Meaning of Learner- Centered Curriculum

The learner-centred curriculum puts emphasis on the maximum growth of the pupils. The concerns of the children are the basis for organizing the children's school programme with emotional involvement of pupils in learning. the whole learning process would become more vivid and valuable.

In Kelly's (1977) views, a child-centred education should take into account (i) the needs of the learner (ii) growth of the learner and (iii) interests of the learner.

John Dewey, the American educationist advocated child-centred education characterized by (i) providing meaningful learning experiences by allowing children to interact with the environment. (ii) educating children according to their stages of growth and development. (ii) teaching to suit the interests and abilities of children and (iv) providing adequate opportunities for children to socialize, inquire and experiment, construct and innovate.

In brief, student-centered curriculum refers to the arrangement of a set of learning experiences, both direct and indirect that allows students to participate fully. Field trips, Laboratory experiments, completing assigned projects etc. are capable of providing direct learning experiences to students. Radio and television programmes, recorded audio and video cassettes, daily newspapers and magazines, text books etc. provide indirect learning experiences to students.

In the learner-centered curriculum, students get involved in learning activities according to their respective interests and are highly active. Learning activities are arranged following the principles of psychology and not on the basis of topics in the subjects (i.e. not based on subject-centered programmes). Programmes are highly flexible and follow democratic procedure. The authoritative attitude of teachers and the uniqueness of the subject areas are removed in this kind of curriculum. But looking from the practical angle, as students are usually immature, the learning will b haphazard and education appears to be a non serious affair. Learner-centered

curriculum may be considered as a highly unstructured curriculum. But designing a curriculum is a task requiring proper planning of educational activities and organizing them to form a good structure. This process gets affected in the learner-centered curriculum.

Important Features of Learner- Centered Curriculum

i) Structure: Student-centred curriculum cares more for the individual learners and development of their potentials. Importance is given for the inculcation of original thinking, practical skills and free expression of one's own ideas. Learning experiences are planned to promote personality development.

ii) Objectives: In student-centred curriculum objectives are not planned in advance. They are formulated on the basis of the needs of students, their interest and developmental stage and as such they are highly flexible.

iii) Contents: Contents are selected based on student's needs, ability to learn, age, aptitude and previous experiences. Lessons are written using words familiar to the students. Rote learning is not encouraged; direct experiences are insisted to facilitate original thinking.

iv)Teaching and Learning: Time allotted for teaching gets reduced, as more time is allowed for self-learning. There is active interaction between the teacher and students which creates a good learning environment. Audio-visual materials and practical demonstrations are increasingly used in the classroom instruction. Students are encouraged to undertake projects, prepare assignments and learn by self-efforts.

v) Grouping of Learners: Students are organised into several learning groups based on their achievement in the subject and interests exhibited. One of the members of the group directs the activities. Students learn through group activities. Formation of groups will vary for different subjects.

vi) Time Schedule and Space: Time-table is flexible and is unlike that followed in subject- centred curriculum. Time is allotted depending upon the nature and difficulty level of the lesson. Learning may take place in different places like laboratory, library, and workshop. gymnasium etc. in addition to the classroom. Whenever necessary, field trips and educational tours are organized. Such flexibility is not possible in a subject-centred curriculum.

vii) Role of the Teacher: In student-centred curriculum, teacher is mainly a facilitator. The social distance between the teacher and students will decrease. Teacher will not hesitate to accept student's ideas.

viii) Evaluation: Apart from teacher's evaluation of students, there is provision for self-evaluation by the students themselves. Students are assessed for how they learn and not merely by what they have learned and this approach encourage students to improve their learning techniques.

Importance of Learner-Centered Evaluation and Assessment

As the learner-centred curriculum focuses more on the individual learners, their needs and interests and development of their potentials, learning experiences provided are both direct and indirect. Classroom discussions, field trips, laboratory experiments, completing assigned projects, preparing written assignments, collaborative learning etc. provide direct learning experiences to students. Radio and television programmes, recorded audio and video cassettes, daily newspapers and magazines, textbooks etc. provide indirect learning experiences to students.

As learning experiences are provided and taking place both in and out of school, involving self-learning as well as group work, assessment and evaluation of learning achievement of students in the learner-centred approach too to be of different modes viz. written, oral and performance based, achievement tests, oral tests, observation and grading using check lists and rating scales, peer-group evaluation, self- evaluation etc. Thus a comprehensive and continuous evaluation programme becomes essential when student-centred curriculum is made use of in the teaching - learning process. Both 'Formative' and 'Summative assessments are necessary to evaluate students' performance and provide for offering feedback then and there so as to improve the learners' performance.

In the learner-centred approach, students choose what they will learn', 'how they will learn and 'how they will assess their own learning. Unless assessment and evaluation of the learning outcomes are done now and then, the learners may not be aware of how far they are proceeding in the right track of learning, how far their learning experiences are fruitful and what course corrections are needed to make their learning effective. Without undertaking formative evaluation often, there is every danger in student-centred approach of learning; students' learning becomes frivolous and wayward. Thus self-evaluation and peer-evaluation are highly important in the learner-centred curriculum approach.

Use of Grading in Assessment

Grading in education refers to classification of students into a few graded categories according to their level of achievement in examinations in every subject of study. Grades can be assigned as letters [generally A to E (Some prefer to use nine point grading scale as A, A B., B, C,, C, D, E,, E, to increase the degree of differentiation) or as a range 1 to 5 (Some use a point scale 1 to 9)].

Grading system was developed by William Farish and first implemented by the University of Cambridge in 1792. Different countries use different grading scales in the assessment of students' performance. In India, following the introduction of Continuous and Comprehensive Evaluation System (CCES), Central Board of Secondary Education (CBSE) started using the grading system with nine point grading scale from the academic year 2010-11 for Stds. VI to X. Tamilnadu Government too is following the grading system from 2012-13 for Stds. I to VIII and from 2013-14 for Stds IX and X.

Important Features of the Grading Scheme

1. In all students' certificates and school records of students' achievement, only grades and not marks will be mentioned, pertinent to the level of performance.

2. The practice of declaring 'pass' or 'fail' has been stopped.

3. The result of candidates regarding their achieve-ment is declared in two categories - (i) Eligible for qualifying certificate and (ii) Advised to improve performance.

4. There will be no mentioning of a thing like 'overall marks'; only 'Grade Point Average' (GPA) is mentioned. All candidates even if they (scoring less than 33%) in one or all subjects will now have five chances to improve their performance without having to repeat a year.

5. Marks obtained by students are to be transformed into a nine point scale, and the pertinent grade corresponding to the level of achievement be marked.

The following table illustrates the nine point grade scale. The minimum level for qualifying in any subject is grade 'D' and above.

Marks Range	Grade	Grade Point	Verbal Discrimination of Grades
91-100	**A1**	10.0	Excellent
81-90	**A2**	9.0	Very Good
71-80	**B1**	8.0	Good
61-70	**B2**	7.0	Good
51-60	**C1**	6.0	Fair
41-50	**C2**	5.0	Fair
33-40	**D**	4.0	Adequate
21-32	**E1**	No Grade Point	Inadequate performance; needs

			improvement
0-20	E2	No Grade Point	Poor performance needs huge improvement

6.Those whose achievement level is below the grade 'D', in any one or in all the subjects will have five chances to improve their level of performance.

7. Those who fail to obtain minimum Grade 'D' in any one or in all the subjects at the Secondary School Examinations shall be given the first chance to improve their level of performance in the examination to be held in about a month, in the same year. Those who succeed in improving their level of performance could study Std. XI, without wasting a year.

8. For calculating the percentage of marks obtained by a student in a subject from the Grade Point, the following formula is to be used.

Percentage of marks
in a subject = G.P in the subject x 9.5

9. Average (GPA) is obtained by dividing the 'Cumulative Grade Points' (CGP) [i.e. Total of the Grade Points obtained in all the subjects] by the total number of subjects.

10.The overall percentage of marks of a student is calculated by the formula 9.5 x GPA

Uses of Grading System

As achievement of students could not be assessed precisely like measuring the external features of objects, grading of student performance using grading system helps in the following ways:

1. It reduces the mental stress of students as it eliminates the thinking that those who score 59% are less proficient than those having an achievement score of 60%.

2. Students having scores lying in a particular class interval are considered to be equal in their level of proficiency.

3. A student's grade does not get influenced by the achievement level of other students.

4. It avoids competition among students.

5. Students who fail to achieve the minimum level of proficiency accepted as adequate, are

given a chance to improve their performance and get admitted to the next higher class, without wasting an academic year.

Feedback Mechanism

' Feedback' refers to providing students with the knowledge of results obtained in the assessment, based upon which they are informed of the deficiencies found in their learning, along with the suggestions for removing them. The primary purpose of assessment is to improve student learning. For this, the feedback followed by assessment helps a lot.

It is the learners whose interest and needs are the real base for the learner-centred curriculum. The feedback in the learner-centred approach is mainly from the learners themselves either directly or indirectly. Their performance, their behaviour, their activities also act as a feedback. The parents who are able to realize the changes happened in children, the teachers who are able to support the learners while they are making and transacting the curriculum and the students who follow the instructions, perform the tasks mentioned in the curriculum, exhibit changes in behaviour and evaluate themselves are all able to give feedback. The peer group of the individual learner can also speak about the changes happened among the members of their group. If possible, other stakeholders of student learning in the school can also give their feedback.

Evaluation

Usually, feedback from various individuals and teams will be evaluated in a systematic manner. Feedback received from various stakeholders including subject expert, teachers teaching the subjets, students who get the benefits of pedogogical concerns of disciplinary knowledge of different subjects, are received and analysed properly. Accordingly, changes are introduced. In the learner-centred curriculum, curriculum is based upon the individual learner's needs and interests and the curriculum makers are the learners; the evaluation of learning progress is also done by the individual learners themselves.

Mostly formative evaluation is undertaken because in each and every step, the individual learners are able to realise the changes, the development and the progress of themselves. So they can evaluate their own learning forma- tively. It is more than the teachers, the learners are able to identify and judge their progress.

Learning Outcomes

In the feedback mechanism and evaluation of learning of individual learners, the central point is the learners, though they are supported and guided by the teachers. So the individuals

who are able to realise the learning outcomes are the individual learners rather than any other individuals concerned, be it the teacher or the parents or any other stakeholders.

Curriculum is developed, designed and implemented by the individual learners, though with the guidance of the teacher. The individual learners are also able to understand better the goals to be reached, how to reach the goal, and at the end, verify whether he has reached the goal. If the teachers try to find out the learning outcomes, they can understand but sometimes it may be deceptive. Only the individual learners know himself or herself better than any one else. So learning outcome of the learner-centred curriculum is realised only by the learner himself/ herself.

Curriculum and its Importance in Learner-Centred Approach

Learner-centred curriculum is based upon 'Constructivist theory of learning' in which individuals when learn, they relate the new information received and skills to be developed to what they have already known, actively practise them and get feedback on their performance.
In this approach students clearly express their learning goals that are related to real life. So students help in the planning of curriculum and also it is relevant to students' real life context. In this approach learners construct their own knowledge from what they are exposed to, in the classroom and what they have already experienced in their lives. So it becomes important for the teacher to view learners as active inquirers who use their previous knowledge and experiences (both mental and social) they have, to develop curriculum to make it meaningful in such a way that it should provide a lot of help and assistance to the learners while they learn.

The curriculum gives students written details about the types of learning experiences they need to acquire for realizing the expected learning objectives. In other words, curriculum familiarizes students with the learning objectives. By this way, it makes the tasks of learning purposeful and goal oriented. This purposefulness makes them motivated towards learning as they are aware of the types of behavioral changes expected as learning outcomes from the study of a particular subject or doing a certain activity to complement learning.

- A properly developed curriculum is accompanied by the resource materials in order to supplement it. These resources include suggested experiments, projects, assignments, references, field trips, etc. These resource materials are important for both teachers and learners.

- A curriculum is a properly developed framework of the teaching learning process. It includes learning objectives that should be known to the learners. When learners are aware of the learning objectives they can plan, execute and evaluate learning experiences for the realization of the learning outcomes of the course studied.

- A well developed curriculum helps the leaner in their learning process from the beginning to the end for the realization of the set learning objectives.

- Realization of these learning objectives results in overall growth and development in all the aspects and dimensions of the personality of the learners.

Advantages of Learner-Centered

When classroom activities are arranged based on student-centered curriculum, both students and the teacher together plan the learning experiences cooperatively and execute them. Instead of sitting in the classroom and passively hearing the lecture of the teacher, teachers and students interact in equal measure. Group activities get encouraged and ample opportunities are provided to students to work together and exchange ideas.

- Students take responsibility for their learning and get themselves actively involved. Every student is encouraged to develop qualities like asking questions and get answered, seeking reasons for anything and everything, independently undertaken etc. completing the tasks

- As students participate directly in learning activities, they show more interest and involvement in learning.

- Student-centered curriculum helps to develop multiple skills including physical and practical skills among the students.

- In learner-centered curriculum, learning wi not be just memorizing and retaining students are helped to reflect on what the learn and how they learn.

- As students themselves are able to dire their learning activities, their motivation learn increases.

- Student-centered learning encourages students to work together and learn

- In student-centered curriculum, student’s needs and interests form the basis for selecting learning experiences, guiding and evaluation. These help the students to get self motivated and get good achievement in learning.

- As the content of the curriculum is based on students' needs, learner-centered curriculum helps students get functional learning.

- Student-centered curriculum is psychologically sound as it is primarily based on growth and development of students.

- Student-centered curriculum helps to well integrate the learning experiences.

- Learning becomes a joyful activity while implementing curriculum. the student-centered curriculum

Limitations of Learner-Centered Curriculum

1. Students at secondary level are not mature enough to know their future needs. Further, they may also exaggerate their abilities. A curriculum based on students' present needs and interests may not meet their future needs.

2. There is a danger that essential contents to be learnt and values requiring training may not find a place in student-centred curriculum.

3. The aspirations and needs of students may widely vary and as such developing and implementing student-centred curriculum is very difficult.

4.As the contents for a student-centre curriculum are organised on psychologic basis and not in a logical sequence, they may lack continuity.

5.In subject-centred curriculum, instruction materials and aids which are available in the market could be used; but in student-centred curriculum the subject teacher himself has to prepare them.

6.Teachers adopting student-centred curriculum need to have wider scholarship and better resourcefulness.

Social Oriented Curriculum for Social Reconstruction

Progressivism is a doctrine born out of the concepts elaborated by John Dewey. Those who follow progressivism argue that what are taught in schools now are the heaps of ancient wisdom; not helpful in preparing students for future life. Progressive educationists advocated problem-solving method. Instead of getting training in multiple disciplines, the curriculum should prepare students to face future real problems of life. Progressivism gives emphasis for qualities like responsible citizenship, adjustment with society and environment etc. To make the society to function efficiently, students should be trained to become good citizens.

Reconstructionism

This has not grown into a fully fledged philosophy. In 1930, it sprouted as an idea and it is still growing. Problems such as race and class discriminations, poverty and unemployment attracted the attention of the progressivisms. Studies on today these problems continue still today.

This doctrine throws light on cultural pluralism, equality and society in crisis; tries to widen the vision of the society. It very much resembles the views of socialism.

Social Reconstructionism

The objectives of this doctrine are to make use of education for bringing social change and motivate students to raise probing questions regarding social inequalities. It supports radical social changes with a long term vision.

Theodre Brameld, a staunch supporter of this movement had expressed the following views

- Social Reconstructionism is committed to creating a new culture. This is essential at this juncture when revolutionary changes are taking place now across world.
- Society is facing many conflicts and problems such as wars, poverty in the midst of affluence, racial discrimination, violence, unemployment, environmental degradation, and oppression by the governments etc. which need urgent attention.
- If society is to be redeemed from such miseries, power should get transferred into the hands of masses.

Social Oriented Curriculum for Social Reconstruction

Curriculum should be so framed to make all social activities get involved in social reconstruction. However only social service and community-centered activities alone are not enough. Schools should take forward social activities and social progress. Beginning with showing interest in social, political and economic progress of the society, then ushering social changes and finally education should lay the foundation for the creation of a just society.

Activities for Social Reconstruction

- Social Welfare Activities: Cleanliness of dwelling and its surroundings, protection of water bodies, tree planting, Maintenance of roads etc.
- Awareness Movement: Conducting exhibitions to highlight the importance of Protecting natural resources, Basics of good life, Small savings, using electronic gadgets etc.

- Duties and Rights: Explaining the fundamental rights and duties of the citizens through cultural programmes.

- Citizenship Training: Giving training in self governance through leadership programmes.

- Adult Education: Conducting summer vacation programmes and participating in literacy movement.

Co-curricular Activities for Social Reconstruction

Indian society is fragmented by social disparities, economic conditions, prejudices based on religion, caste and language, lack of equal opportunities and personal safety for women. Today, the urgent need of education is to change this condition and create social cohesion. The following could be undertaken to achieve this:

- Secular education

- Education for all

- Enrolment of student's discrimination of religion and caste without

- Students living together in hostel

- Emphasizing the values of concepts like social equality and social justice

- Promoting mutual understanding through sports, common curriculum, literature, drama and cultural programmes.

Unit-v

LIFE- ORIENTED CURRICULUM

Introduction

Life oriented curriculum is study of self, in relation to others and to society. It addresses skills knowledge and values about the self, the environment, responsible citizenship, a healthy and productive life, social engagement, recreation and physical activity, careers and career

choices. These include opportunities to engage in the development and practice of a variety of life skills to solve problems, to make informed decisions and choices and to take appropriate actions to live successful in society. It not only focuses on knowledge, but also emphasise the importance of the application of skills and values in real- life situations

Life Orientation is one of the compulsory subjects required for the National senior certificate (NSC).It applies a holistic approach to the social, personal, intellectual, emotional, spiritual, motor and physical growth and development of learners.

The subject contains the following six topics

- Development of the self in society
- Social and environmental responsibility
- Democracy and human rights
- Careers and career choices
- Study skills
- Physical education

The issues contained in the above topics are interrelated and are related to the topics dealt with in each graded classroom. The content taught in lower grades serves as the foundation for the content that is taught in the higher grades. Due to its holistic approach, no learner will leave the school system without the knowledge, skills and values to become a balanced and confident individual who can contribute to a just and democratic society, a productive economy and an improved quality of life for all.

Definition of Life orientated Curriculum

A life orientation is the study of the self-in relation to others and does society. It applies a holistic approach. It is concerned with the personal, social, intellectual, emotional, spiritual, motor and physical growth and development of learners, and the way in which these dimensions are irrigated and expressed in life. The focus is the development of self-in society, and this encourages the development of balanced and confident learners who will contribute to a just and democratic society, a productive economy, and an improved quality of life for all.

Life orientation guides and prepares learners for life, and for its responsibilities and possibilities. That subject of life curriculum addresses the following

- Knowledge
- Values
- Attitudes
- Skills about the life
- The environment
- Responsible citizenship
- A healthy and productive life
- Social engagement
- Recreation
- Physical activity
- Career choices

It equips learners to solve problems, to make informed decision and choices, and to take appropriate actions to enable them to live meaningfully and successfully in a rapidly changing society.

Life Orientation is an interdisciplinary subject and draws on and integrates knowledge, values, skills and processes embedded in various disciplines such as sociology, psychology, Political science, Human Science, Labour studies and Industrial Studies

LIFE ORIENTED CURRICULUM

New challenges have emerged in terms of the needs of students within the higher Education environment and the realties for which they must be prepared for in order to meet the demands of an ever changing professional area.

The curriculum aims to develop the full potential of each learner, and seeks to create lifelong learners who are confident and independent, literate, numerate and multi-skilled, compassionate, with a respect for the environment and the ability to participate in society as a critical and active citizen.

Life oriented curriculum is unique as it applies a holistic approach to the personal, social, intellectual, emotional, spiritual, motor and physical growth and development of learners. This encourages the development of a balanced and confident learner who can contribute to a just and democratic society, a productive economy and an improved quality of life for all.

The Life oriented curriculum includes:

- Social transformation;
- Outcomes- based education
- High knowledge and high skills;
- Integration and applied competence;
- Progression;
- Articulation and portability;
- Human rights, inclusivity, environmental and social justice;
- Valuing indigenous knowledge systems; and
- Credibility, quality and efficiency

Social transformation

Social Transformation in education is aimed at ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sections of our population. If social transformation is to be achieved, all have to be educationally affirmed through the recognition of their potential and the removal of artificial barriers to the attainment of qualifications.

Outcomes-based education

Outcomes-based education forms the foundation for the curriculum. It strives to enable all learners to reach their maximum learning potential by setting the Learning Outcomes to be achieved by the end of the education process. Outcomes-based education encourages a learner entered
and activity-based approach to education.

The required outcomes of the learners are:

1. to identify and solve problems and make decisions using critical and creative thinking.
2. to work effectively with others as members of a team, group, organisation and community.
3. to organise and manage themselves and their activities responsibly and effectively.
4. to collect, analyse, organise and critically evaluation information.
5. to communicate effectively using visual, symbol and/or language skills in various modes.
6. to use science and technology effectively and critically showing responsibility towards the environment and the health of others.
7. to demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.
8. to reflect on and explore a variety of strategies to learn more effectively.
9. to participate as responsible citizens in the life of local, national and global communities.
10. to be culturally and aesthetically sensitive across a range of social contexts.
11. to explore education and career opportunities and
12. to develop entrepreneurial opportunities.

High knowledge and high skills

The Life oriented curriculum aims to develop a high level of knowledge and skills in learner. It sets up high expectation of what all learners can achieve. Social justice requires the empowerment of those sections of the population previously disempowered by the lack of knowledge and skills.

Integration and Applied competence

Integration is achieved within and across subjects and fields of learning. The integration of knowledge and skills across subjects and terrains of practice is crucial for achieving applied competence. Applied competence aims at integrating three discrete competencies – namely, practical, foundational and reflective competencies.

Progression

Progression refers to the process of developing more advance and complex knowledge and skills. Each learning outcome is followed by an explicit statement of what level of performance is expected for the outcome.

Articulation and portability

Articulation refers to the relationship between qualifications in different National Qualification Framework levels or bands in ways that promote access from one qualification to another. In order to achieve this articulation, the development of each subject statement included a close scrutiny of the exit level expectations in General Education and Training Learning Areas, and of learning assumed to be in place at the entrance levels of similar disciplines in Higher Education.

Portability refers to the extent to which parts of qualification (subjects or unit standards) are transferable to another qualification in different learning pathway of the same National Qualification Framework levels or bands.

Human rights, inclusivity, environmental and social justice

The Life oriented curriculum seeks to promote human rights, inclusivity, environmental justice and social justice. The Life oriented curriculum adopts an inclusive approach by specifying minimum requirements for all learners. It acknowledges that all learners should be able to develop to their full potential provided they receive the necessary support. The intellectual, social, emotional, spiritual and physical needs of learners will be addressed through the design and development of appropriate learning programmes and through use of appropriate assessment instruments.

Valuing indigenous knowledge systems

Now a day's people recognise the wide diversity of knowledge systems through which people make sense of and attach meaning to the world in which they live. Indigenous knowledge systems refer to a body of knowledge embedded in the philosophical thinking and social practices that have evolved over's thousands of years.

Credibility, quality and efficiency

The Life oriented curriculum aims to achieve credibility through pursuing a transformational agenda and through providing an education that is comparable in quality, breadth and depth to those of other countries.

Inter-disciplinary curriculum

The concept of interdisciplinary curriculum is regarded as a form of co-operation between various disciplines which contribute to achieve a common end. It examines a theme, issue, problem, topic or experience in the view of multi- disciplines.

Vary from discipline field based view of knowledge interdisciplinary stress linkage

Meeth, notes that interdisciplinary stress to identify the relation between disciplines. It is a holistic approach with a tradition in western through that comes from Plato's ideal of unity as the highest good in all things. In short interdisciplinary.

In present scenario if the problems in the modern world which can not solved by individual subject are identify and verify by various subject specialists. So the curriculum for the higher class in school should frame in base of inter-disciplinary approach

For example under the topic of eyes, structure of eyes(anatomy), sight problems in eyes (Physics) Protect eyes and strengthen eyes (Physics) muscles (Yoga and Physical Ed) were included in integrated curriculum

The growing need for inter-disciplinary curriculum

Need for follow inter disciplinary curriculum in education is increasing day by day. The problems that world face is seem in all branches of disciplinary curriculum to students, s necessary, for giving a holistic knowledge about their problems they faced in their life.

The world we live is unity we can be look at the problems in variety of ways. Each discipline looks at the world in a particular point of view. If we set curriculum in base of disciplines, knowledge is separated and draws boundaries. This ends in the result that students can't able to develop their overall view over a problem. So the knowledge gained by them is

changed into single track knowledge instead of functional knowledge and block their functioning skills

For making a student to sense the world, to be able to operate successfully as a person, as a citizen, as a productive worker interdisciplinary curriculum is need and necessary one for them

Current subject disciplines arose in 19th century. Developments of this century cross the old boundaries, in nuclear technology, in space research, computer science and molecular biology. So we cannot restrict the possibilities to dividing lines which may cease to be relevant

The current curriculum arose in traditions of Europe, to emphasis the preparation of best student. But in current scenario for whole population, including both intellectual development and aspects of productive work the traditional areas of study are less appropriate. In addition to traditional area of study different subjects such as environmental education, education and work, education and world peace should be included

The need for inter disciplinary curriculum is growing step by step in present situation. It helps to find solution for the problems such as increasing population, sexual harassments, unemployment etc.

To enrich the problem solving skill among student interdisciplinary approach is a required one.

Science and technology education should be associated with productive work, in order to prepare the rising generation to face the problems of everyday life and the community, at the same time to foster positive attitudes to work. Which means link social science and humanities, along with science and technology?

Broadfield Curriculum

This curriculum is also called as integrated or fused curriculum. When the types of curriculum design are kept in a linear line, the one end will took place by subject-centered curriculum and learner centre at the other end, Broadfield curriculum occupy centre place of the line. The core concept of this curriculum is to make connection by using students and subject as a resources. It seeks to bring together subject matter that has brought together subject matter that

has common relation in a whole area of study. The basic consideration in Broad field design is to ways to bring that subject matter which have certain relationship

Types of fusion or integration

Integration may induce in two ways

1) By combining so many subjects the students get a shallow amount of knowledge in comparison to the deeper content of a single subject

i) Combining physics ,chemistry and form a single subject physical science

ii) Integrate Botany, Zoology and Anatomy to form Biology

iii) Merge Economics,civis, geography and history to form a single subject social science

2) In this type, only the concept is merged and there is no need to join subjects

For example topic such as "Air Pollution" 'world level growth of democracy' where take to concern

Under the common topic 'Air Pollution'

i)Acids that pollute air (Chemistry Subject)

ii)How thermal power and Atomic power plant polluted air (Physics)

iii)Natural causes such as volcano, forest fire etc(Geography)

iv)Air pollution cause by the decomposing of living beings (Biology)

We can combine this element to Integrate curriculum

Need for Curriculum Integration

To counteract the negative effects of various subjects, content areas or topics, educational experiences the term curriculum integration is introduced. Usually, this term is used to reduce the combination of two or more subjects to form a meaningful learning area that help effective learning experiences for the learner

Over the past few years, the interest and need for curriculum integration has become stronger –throughout the country for several reasons

1)The growth of knowledge

From the last century onwards, growth of knowledge is at the peak in all areas of study. Because of this cause there is an expansion in all subjects by research. If we look at one subject area, we can see the remarkable degree of specialization. Cause of this a uniform subject discipline is formed and still they forming. Including these all in a curriculum is an impossible one. It is the duty of the curriculum designer to know the subject design and also what is to be included and which area is going too excluded.

2) Enduring social problems

Because of recent crises in society there is a need for curriculum integration. For example, many states now require curriculum covering about AIDS, Drug prevention and sexual abuse. Students should need aware about these topics. Over the time of past 15 years the working days of a school for an academic year is 220. Still this continues. So curriculum integration is essential one to reduce the burden of curriculum.

3) Curriculum Integration

To make connection between the subjects and to provide a holistic knowledge the curriculum integration is essential. No matter what the content is to be taught, we can design active linkages between fields of knowledge. We can teach the works of Shakespeare with an eye to the history of the times, the arts, the values, the role of science and the faith rather than simply teaching with specific passage.

Integrated curriculum attempts an effective means of presenting the curriculum. The curriculum becomes more relevant when there are connections between subjects rather than strict isolation.

TEACHING OF SCIENCE AND MATHEMATICS FOR NATIONAL DEVELOPMENT

Science Education and Mathematics Education share several commonalities in regards to the values, as well as several challenges. Science is seen as an essential part of culture and a

powerful way of thinking. Science education is necessary for the world of work and the economy. Science development in recent decades has, and will continue to have, a significant influence on topics that have great importance for humanity, quality of life, the sustainable development of the planet, and peaceful coexistence amongst peoples. From the immediate basic essentials of life such as access to water, food and shelter, to important issues that affect us all (management of agricultural production, water resources, health, energy resources, biodiversity conservation, the environment, transport, communication), all have a strong science component to which everybody should have access to take part in local, regional, national and transnational decision in a meaningful way.

Every citizen needs to be able to take decisions that affect individuals, communities, regions, our countries and the world, decisions that need a science education based on an understanding of ethics and of interdependency. Thus, science learning has to be seen as necessary for the full realization of a human being. When the majority population is scientifically illiterate, it not only aggravates inequity but also presupposes the exclusion of this majority from true participation in and influence on their environment. There is a connection between national and personal development on the one hand, and increasing the quantity and quality of science education on the other hand, is not simple or direct. This shows that every society must pay particular attention to the scientific and technological education of its future citizens.

The expression the 'knowledge economy' or, more accurately, the economy built on knowledge evokes the new paradigm which characterizes the evolution of industrial nations.

Economic structures, which previously were strongly connected to the manufacturing sector; today rely largely on knowledge and understanding. These are economies "in which the generation and the exploitation of knowledge has come to play the predominant part in the creation of wealth. It is not simply about pushing back the frontiers of knowledge; it is also about the more effective use and exploitation of all types of knowledge in all manner of economic activity." The spectacular change has been brought about by a number of elements that are both causes and effects of this transformation. Thus, the unequalled revolution in information technologies has given birth to an industry with powerful growth dynamics while offering unequalled opportunities for sharing and exchanging information. In practice, in today's society, enormous and growing quantities of knowledge are produced and made available and the

advances in ICT are a key driver in this phenomenon. So much so that the products of the industrialized economies now integrate significant scientific and mathematical knowledge.

More and more, the knowledge linked to these competences and abilities is mathematical, scientific and technological, paralleling the knowledge involved in the very products of those economies. In this way, knowledge, especially scientific and technological knowledge, has become the principal resources. Consequently, the new strategies for growth have knowledge as the central axis for sustainable development and so improve the quality of life of people and Science is at the heart of this knowledge growth.

Mathematics has been described as a precision tool used by all scientists in their search for a clear understanding of the physical world. Mathematics as a school subject is recognized as the foundation of science and technology without which a nation can never become prosperous and economically independent.

The National Policy on Education recommends the teaching of mathematics at all levels of education. In a similar way, the National Policy on Science and Technology envisages an education system that shall emphasize all levels and re-orient the entire society towards scientific thinking in order to develop new technologies and adapt existing ones to improve societal wellbeing and security.

Mathematics permeates the whole of society, and its role would appear to be one of ever-increasing importance as its help is sought in handing situations and problems, which arise outside the field of mathematics itself. Mathematics methods are no longer the prerogative of scientists, engineers, and technologists, they are increasingly being used to analyse individual behaviour, to study attitudes and trends in opinion within the society as a whole. This shows that there is no way a society or individual can develop without the knowledge of mathematics.

When national development is mentioned there is the tendency for one to equate it with economic development. National development is not synonymous with economic development rather it is a part or dimension of total development of the society. It is the extent to which a nation is able to overcome her complex socio -economic, political and cultural issues to ensure progressive changes in the quality of life of all her citizen. It is defined that development is a continuous improvement of material and human resources of a nation in order to maximize and manipulate the physical environment for the benefit of the citizenry. To this extent national development implies improvement in the living standard of each citizen.

The invention of satellite, mobile phones, the high security gadgets are the products of science and technology. Mathematics is an instrument for fostering scientific and technological advancement. The usefulness of mathematics to the ordinary man is its ability to develop his reasoning faculty to the extent of modifying man's pattern of reasoning. Hence, the knowledge of geometry and trigonometry are the most rapid in architecture, surveying, building, modelling, sculpturing and medicine, which consist major parts of national development. Internationally, the computer usage worldwide was made possible because of the knowledge of mathematics.

Computer is a facilitative technology and merely allows those who are already doing something to do more of it faster and more accurately. Quantitative techniques which are an aspect of mathematics, are those statistical and operations research or programming techniques, which help in the decision-making process especially concerning business and industry. A lot of mathematical knowledge us used in modern industries in determining which models of machines would produce greater materials at a maximum profit within minimum time.

In banks, basic knowledge of mathematics is needed for effective and efficient transaction between the bankers and their customers. Good knowledge of mathematics is essential for the manipulation of building blocks into dams, construction, machines and structures. Since man cannot do without the basic ingredients for survival, coupled with the elementary fact that mathematics is the core ingredient for all these, man must as a matter of necessity, learn, understand and apply the language of mathematics to sustain and maintain in existence. From the foregoing, the contributions of mathematics and everyday life in national development could be seen.

Thus it is clear that science and mathematics education are the essential tools for every nation's development and they are equally essential tools for sustainability of every national development.

Issues and Concerns in the Selection of Subject Content of Curriculum

Problems in the Selection of Curriculum Content

Framing a new curriculum for school education is a challenging task. By selecting the content of the curriculum, the priorities to be given, our assumptions about what constitutes a 'Good Education', and the new society we visualize through children by their education, are spelt out.

We have already seen the drawbacks in selecting the content according to disciplines in terms of main subjects as well as framing the curriculum with inter related subjects. Hence, in organizing the curriculum content, following the inter-disciplinary approach is the best method. Moreover, we know it is the imperative need in the present context. But the complication in it is the loss of the scope and specificity of the subjects taught. As a way out to solve both these problems i.e. to protect the scope and specificity of the educational disciplines or accept dilution of the power of the curriculum by following inter disciplinary approach which is seen as 'either or' polarity, the wise choice is to follow an eclectic approach. This approach is nothing but selecting and organizing the curriculum content adopting effective inter- disciplinary approach, taking the best from both discipline-based and correlated approaches.

Organizing Curriculum Content Based on Experiences of Children, their Natural Curiosities, Community Environment and the Specificities of Subjects

The environmental crisis that we are facing now, make us realize what should be the aim of education. The ideal education is the one which not only care for the community in which one lives, but also which produces knowledgeable and responsible citizens who evince interest in the well-being of the people in the world at large. Teachers who follow the environment-inquiry approach in their teaching will give importance to the under mentioned four parts in their path. a) giving importance to children's experiences b) providing opportunities to express their natural curiosities c) making students to evince interest to understand, change and improve the prevailing community environment and d) developing in students the relevant knowledge, appropriate practical skills, attitudes and values according to the nature of the subjects they study.

If the teacher pays attention to these four elements in his teaching, children's curiosity to learn about the world, will guide the teaching to be based on objectives, to develop creativity and show concern and care in eradicating social maladies. To put it in another way, if the teacher follows inquiry-based approach in his teaching, it will be possible to nurture the natural interests of the students and make them life-long learners.

Experiences of the socio-cultural environment in which students live should also find a place in school curriculum. Though community- based personal identities like gender, religion,

caste and class are important, they can also be oppressive and perpetuate social hierarchy and social inequalities. The curriculum should help students to understand the social reality through the prism of school education. School curriculum should provide opportunities to students to mutually share their social experiences and discuss about them with their friends and family members.

Curriculum should be so framed to facilitate every educational institution be willing to lend its ears to hear the demands of the society around it, showing its concern and care, and involving its students in selfless service to develop social awareness among the people. In short, curriculum should provide room for students getting social experiences, improving their language skills and interacting with community members.

As the personal experiences of students, their natural curiosities and social environment are to be taken care of, importance should be given in the content of the curriculum to provide appropriate learning experiences for developing knowledge, values, practical skills and attitudes specific to each subject that find place in the curriculum. It is also necessary that educational activities that find place in the curriculum are to be planned in such a way that they bring out the similarities among the areas of different subjects and their topics, specificities of subjects and their inter-relations between subjects..