5

Social Science as a Subject and Discipline

INTRODUCTION

Social science is concerned with the man's relationship with the society. As such it deals with all those subjects that study and enquire into such relationships. ***Seligman*** said that social sciences are mental and cultural sciences which probe the activities of man as an individual or a member of the society, Mitchell said that the term social science is loosely applied to different kinds of study related to man and society. He further stated that it is a scientific method of studying intricate and complex network of human relationship within the social set up. Its objective is to enable people live well as a group member. Social science is often referred as a general term for all sciences that study human affairs. Social science has to do with the social laws that govern society and the social department of man. So it may be said that social science is a conglomeration of subjects dealing with man vis a vis society.

The main thrusts of social science may be summarized below–

(a) It studies the change in human relationship and seeks to reinterpret the past and present events.

(b) It investigates the human activities, interaction of cultures and their spatial distribution.

(c) It discusses the basic social systems, institutions and organizations.

(d) The social science subjects are concerned with the relationship between individuals and institutions which include political economic and social institutions.

(e) Another focus of study is the nature of the society and the interactions of people with each other.

5.1. NATURE AND PHILOSOPHY OF SOCIAL SCIENCE

Social sciences deal with the socio cultural aspects of human behavior. It is defined as the scholastic discipline or scientific field that investigate human society, that is man and his relationship with other men and environment. It follows scientific method to acquire knowledge of the characteristics of human beings, their culture and all the aspects associated with their physical environment.

The accumulated knowledge of social science is gathered through systematic experimentation and observation at nonjudgmental level. It studies people, places and their behavior and explore the meanings behind human behavior and actions. It evaluates why and how people respond to a particular set of circumstances and conditions.

Social science as body of knowledge has distinct differences from other disciplines like natural sciences and humanities. In natural science, physical environment and the functioning of living organisms such as human beings and their relation with other animate and inanimate objects are studied. Humanities on the other hand, explore man's creativity, imagination, subjective expressions of art, literature, religion, philosophy and music. The subject matter of Social sciences comprises group life of man, pattern of behavior including group behavior and interpersonal relationship. Thus subjects classified as social sciences are cultural anthropology, economics, political science sociology, social psychology and geography. The ultimate objective of social science is the development of democratic civilization. Thus the central function of social sciences is very much similar to that of the discipline of education.

Social Science and Social Studies

Social science and social studies are quite similar in nature. The term "social studies", in elementary and secondary education, includes sociology, history, political science, economics, religion, geography, and anthropology. Social sciences also contain subject matters from all these disciplines. The objectives of both are also same. The basic objectives of these disciplines are to develop civic competence of the future generation. The National Council for the Social Studies in America has defined social studies as the integrated study of social sciences to develop among students the knowledge, skills and attitude required to function in a democratic republic.

However there are some differences between the two disciplines which are discussed below—

- Social studies are mainly taught at school level whereas social science is related with higher education.
- Social sciences have a broader scope in the sense that research methodology and development of related theories are important aspects of social science. As such social studies deals with instruction at lower level and social sciences are pursued at higher level of education.
- Generally social studies draw subject matter from disciplines of history, geography, sociology, economics, fine arts and languages. But social science is more comprehensive as its branches include, apart from these traditional disciplines, new and emerging disciplines like demographic social study, human geography, environmental planning, economic management, business studies, law, politics international relations, psychology, science and technology studies, social policies, social work, education, linguistics, social anthropology.

The Scope of Social Sciences

It has already been mentioned that social sciences study the relation of man with his social, natural and cultural environment. Therefore they encompass wide range of content. Not only it studies social processes but also it is concerned with the normative responsibility of man. It signifies that the social sciences should teach the students social values, morality. The social sciences must also help the students to identify the social forces that threaten the social values.

Social sciences comprise different branches of knowledge. So its scope is obviously broad including subjects with different types of social implications. Seligman pointed out that social sciences may be classified under three groups of subjects. These are–

- Pure social sciences. The subjects included in this category are political science, history, economics, anthropology and sociology, jurisprudence etc.
- Semi social sciences which are not pure social sciences but with huge social implication while having their special subjective knowledge.
- Social science with scientific implications. These are biology, medicine geography, language and art.

Different exponents of social sciences have different opinions regarding the different types of social science subjects.

Fairchild suggested the following subjects within the category of social science–

- Economics
- Government
- Law
- Psychology
- Sociology

Ranganathan added a few more subjects in this category which are as follows

- Education
- Geography
- History
- Political Science
- Economics
- Sociology
- Law are Social Sciences

Willson Gee has given the most elaborate list of social science subjects which are given below.

- Sociology
- Economics
- Anthropology
- Statistics
- Psychology
- Jurisprudence
- History
- Philosophy
- Political Science

Indian Council of Social Science Research mentioned the names of the following subjects within the broad ambit of the discipline social science.

- Economics
- Commerce
- Education
- Management
- Business Administration
- Political Science
- International Relations
- Psychology
- Public Administration
- Sociology
- Criminology
- Social Work

- Anthropology
- Demography
- Geography
- History
- Law
- Linguistic

The variation in the number of social science subjects is due to the social changes and the progress of human civilization. As D.L. Sills, editor of the International Encyclopedia maintained that social sciences differ in their scope from one generation to another. Therefore, he proposed the inclusion of subjects like Anthropology, Economics, Geography, History, Law, Political Science, Psychiatry, Psychology, Sociology and Statistics in Social Sciences. It is to be admitted that areas within the discipline of social science are flexible the discipline has no mono disciplinary characteristics. It is an umbrella term implying the plurality of fields of studies. More and more new subjects are emerging with strong social implications, though they are not being considered as social science per se, examples being international relations, social work etc.

A brief discussion on various disciplines included in the broad discipline of social sciences is discussed below–

The various disciplines included in the broad discipline of social sciences are discussed below—

- ***History:*** It is an integral part of social science as it helps us to understand our past. It gives an insight into how the world came to be, how different cultures developed, how things started and about our ancestors. Most importantly it develops critical thinking by identifying causes and effects of historical events. This insight helps us to deal with conflicts among the nations and individuals.
- ***Geography:*** Geography as a branch of social science is essential to learn how physical systems affect our everyday life. The knowledge of geography is

instrumental in understanding the role of geography in evolutionary process, spatial organization of society. It helps us to appreciate the Earth as our homeland and how wisely it should be managed. Most importantly geography teaches about the interdependence of the nations and how to grow up as global citizen.

- ***Political Science:*** It is one of the very important branches of social science. The aim of social science, that is to develop civic competence, is best developed through the study of political science. The different sub branches of it are comparative politics, public administration, international relation and public law. It helps the students learn about their political rights and privileges and gain knowledge about the State, Government and Administration. Aristotle called it master science. The students while studying it learn about who gets what, when he gets it and how he gets it. Without active participation of responsible citizens the government is rendered vulnerable to manipulation of unscrupulous elements. Thus study of political science is necessary to be a good citizen.
- ***Economics:*** Economics is all about how the society uses its limited resources and is concerned with production, distribution and consumption of goods. Economic education at school level is essential so that the population acquires the ability to comprehend and evaluate critical economic issues and take personal and social decisions. An individual cannot be a citizen in real sense of the term unless he is an economist to some extent. Economics helps a person to understand complex issues like optimum allocation, equitable distribution of wealth, unemployment and inflation. Basic knowledge in economics is required to comprehend fiscal policy , development strategies and budget. Thus economics is an integral part of social science.
- ***Sociology:*** It deals with the relationship between man and his society. It explains the social nature of man,

why he lives in group, why is he called a social animal. The study of sociology helps in understanding the group dynamics, the functions of social institutions and the nature of social life. People also come to know about the motives aspirations and status of other people through study of sociology. As economics helps us to get the things we want to have similarly sociology tells us to become what we want to be. Learning the contents of sociology contributes to become good citizen because the individual knows about himself, his potentialities, limitations and his role in society. An individual is also able to overcome prejudices and misconceptions with the insight he gains from the study of sociology. Sociology educates a man about social changes and how to cope with them.

- ***Education:*** Education is another important branch of social sciences. It deals with the process of teaching and learning while seeks to develop skills and positive attitude. Education itself is an interdisciplinary subject drawing contents from other disciplines like philosophy, psychology history sociology and other subjects.
- Public administration is another subfield of social science. Its fundamental goal is to advance and develop effective management and undertake policies so that government can function. It is the study of government decision making, analysis of policies and their evaluation. As such it is an important branch of social science for good governance and for the training of the citizens of a country. Although it is one of the main branches of political science yet public administration as a social science subject is steadily developing.
- Management, Business studies and Human Resources are some of the newly emerging branches of social science. This particular field of study is mainly concerned with planning, organizing staffing, leading, motivating the people for accomplishing the desired goals of the organization. Management of human resources is the ultimate objective of the different organization. Therefore these are important branches of social science and the subject of applied research.

Apart from above mentioned branches of social science, there are many other disciplines which are to be included within the umbrella term of social science. Mention should be made of law which seeks to ensure orderly and just society, science and technology study which deals with history and nature of science and the role of the scientists in society and psychology which studies human behavior. Demography, social work, management studies social anthropology are now emerging fields of social science.

It needs to be remembered that although the branches of social sciences have discussed separately social issues and problems can never be addressed by one discipline only. It requires input from many disciplines to tackle social problems like large scale corruption, religious fanaticism, erosion of moral values, spurt in criminal behavior, child trafficking, drug abuse, low status of women, environmental pollution, tribal welfare, regional imbalances etc.

History of social science

The beginning of social science in the 18th century may be traced to encyclopedia of Diderot. It also contained the articles from Rousseau. Other encyclopedias used the term social science in modern period. Comte proposed the term science social when he referred this field of knowledge. He also used the term social physics in this respect. The thinkers like Comte, Durkheim, Marx and Weber helped to develop the discipline of social science which was referred as sciences of society.

In the 19th century the discipline of social science was initially formed with five major branches of knowledge namely jurisprudence and amendment of law, education, health, economy and trade and art.

The 20th century witnessed the rapid development and broadening of the scope of social sciences. In 1924 social

scientists set up Pi Gamma Mu Honour society for social science. Its key objectives were to promote interdisciplinary cooperation and develop an integrated theory of human personality and organization. Later on a journal for interdisciplinary scholarship in the various sciences and lectureship grants were founded.

Social economic and political problems emerged with the rise of industrialism. Creation of mass education system, management of resources for military, effect of industrialization, senselessness of the great wars etc were the issues which gave further impetus to the development of social sciences. Scientifically collected data were required for adequate and reliable decisions so that correct decisions can be taken instead of emotional and irrational decisions. Thus interdisciplinary and cross disciplinary nature of scientific inquiry into human nature further emphasized on the emergence of various subjects within the discipline of social science. Today quantitative and qualitative methods are simultaneously used to study human actions which are the subject matter of social sciences.

Philosophy of Social Science

The history of development of social science should be traced to the age of Enlightenment after 1650 which would indicate how philosophy and philosophers have influenced different branches of social science.

Social science originated from moral philosophy and was influenced by age of industrial resolution and French revolution. It emerged as the field of study of a group of interacting entities.

During 18th century the articles written by Rousseau had profound influence on social science. Positivistic approach, a characteristic of modern period also affected this branch of knowledge. The sense experiences were given more importance rather than metaphysical speculation. The great thinkers like Marx, Weber, Comte and Durkheim exerted strong influence on social science.

During 20th century along with quantitative approach, application of mathematics on social science, the qualitative approach, interdisciplinary, cross disciplinary approaches to these subjects became evident. Thus qualitative and quantitative methods were integrated. Because of this integration and blurring of boundaries of traditional subjects new branches of interdisciplinary subjects like sociobiology, neuropsychology bio-economics emerged.

Another influential school of thought was postmodernism which has given new meaning and concepts to social science. Postmodernism is loosely defined term with some key tenets. One important tenet is knowledge and truth is relative to a particular culture or historical period. According post modernists there is no fixed or universal nature of man and human nature is socially constructed. A particular variant of postmodernism is social constructivism. Post modernism forces the social scientist not to look for pattern, structure or laws that transcend history or culture. For post modernists to understand societies local and contextual elements must be taken into consideration.

History, Geography, Political Science and Economics are included in the broad discipline of Social Science. All these subjects have distinct methodologies and boundaries and their separate identities are to be preserved. But interdisciplinary pluralistic approach is often required to explain and understand many social phenomena.

Social science as a discipline contains various topics concerning society as such it has wide range of content. It envisages the development of analytical mind and critical understanding of the society. The social science is considered to have normative responsibility regarding inculcation of human values like freedom, trust, mutual respect and respect for diversity. It seeks to build knowledge base for just peaceful society. The students learn to think independently and identify and tackle those forces which threaten the human values.

The philosophy of social science has been compared with that of natural sciences. The philosophy as a discipline

deals with logic, epistemology (nature of knowledge) metaphysics (nature of things) and ethics. The natural sciences can take major decisions in all these aspects as it has established body of successful answers to many questions. But psychology and other social sciences do not have consensus regarding many issues. The matters become complicated as social science deals with human behavior which is unpredictable and caused by multitude of factors. So there is absence of agreement and benchmarks regarding various social issues. It is difficult to make choices in social science. Besides, unlike natural science social science is normative in nature. The explanation, generalization causation of human behaviour has been found to be controversial and debatable issues. However ethics and moral philosophy is not directly related to science as natural sciences study phenomena as they are whereas social sciences are more concerned with what things should be. This is why ethics and morality are important aspects of social science.

The importance of the philosophy of social science can be explained from two points of view. First social processes are complex and poorly understood especially in 21st century when social changes and technological advancement are taking place in leaps and bound. Secondly moral issues in the context of social progress are not always settled properly. The unsettled status of our current understanding of the logic of social science knowledge and explanation often create philosophical questions. Different research methodologies and explanations are to be applied in the social sciences, as current social science inquiry is often vague and controversial. Thus it is evident that philosophy can play an important role in the development of the next generation of social science disciplines.

5.2. SOCIAL SCIENCE AS AN AREA OF STUDY

The NCF (2005) and National Focus Group on teaching Social Science (NCERT, 2006) have had identified the issues to be addressed regarding curriculum and teaching of social science.

(a) The content load of the subject is a matter of concern and suggestions of the Yash Pal Committee and NCFSE (2000) are to be accepted in this regard. Instead of including mass of information the focus should be on concepts of social issues and the objective should be development of ability to analyze socio political reality. There should not be emphasis on retention without comprehension.

(b) The curriculum should reflect issues related to nation and national unity along with local issues and perspectives so that local people can relate themselves to nation and national development.

(c) Textbooks of social science are not be written as instructive but suggestive. It is not the only source of knowledge but one of the sources. The students will be encouraged to go beyond text books and look for further reading to understand social phenomena. In a plural society like ours the textbooks should reflect themes from all sections of society so that they can relate to the broader perspectives of Indian society.

(d) As it has already been mentioned that social science focused more on 'developmental' issues. It was proposed that there should be shift of focus from this utilitarian aspect to egalitarianism.

(e) One important change that was introduced was the nomenclature of civics. Civics was introduced during the British period with objective of minimizing 'disloyalty' of the British subjects. The new name political science is characterized with dynamism and the study of the subject will create a civil society of informed receptive and responsible citizens.

(f) These documents want to address the issue of gender and suggested gendering of the curriculum. It does not mean only giving examples of the contributions of a few women of repute but changing the patriarchal concept of society through teaching of social science.

The curriculum of social science at different stages of school education was discussed in the NCF (2005). During the primary stage of education natural science and social science are integrated as environmental science. The students will be encouraged to observe, identify and classify various natural objects and social issues. They are to be sensitized regarding social differences, diversity and gender disparity. The study of social science will help them to understand the relationship between social and natural science. At the upper primary level the students start learning about their regions and country and are introduced to issues like poverty, illiteracy, child and bonded labour, the functioning of the government at local and state level.

At the secondary level the students should learn to analyze and think critically about these issues. Contemporary issues posing socio economic challenges are included in the syllabus. In geography the resource, development and conservation are discussed. In political science the values enshrined in the Constitution namely equality, liberty, justice, fraternity, plurality and freedom from exploitation are highlighted. Economics is included at this stage and the focus is not on statistics rather discussed from the perspective of masses. The students also learn about the functioning of economic institutions. In the next stage of higher secondary level the students have the option to choose the subjects from the social science group. This is where academic specialization begins.

Social science is often taken for nonutility subject with lesser value for job market in comparison to science. It is also considered as inferior to science which is accepted as the domain of bright students. It needs to be emphasized that social science is also inquiry based like natural science only its methods are somewhat different. The expanding service sector has increased the relevance of social science in job market. But instead of highlighting this point it is better to make people aware of its potentiality for developing critical and analytical mind.

Teaching the Social Sciences (NCERT)

The NCF made important suggestions regarding teaching methods of social science. The interactive method is the best approach to develop creativity and critical thinking. The teaching is not giving information only rather the focus should be debate and discussion. The concepts need to be cleared through lived experiences of the individuals and community. The projects are effective means of social science teaching but NCF cautioned against the use of readymade project materials available in the market.

Both in service and pre service training of the teachers are important pre requisite to effective teaching of social science. The NCF had admitted that the training of the teachers is given inadequate emphasis. Only effective teaching can remove the sense of low self esteem reduce curricular load and encourage critical thinking and develop concept instead of cramming and rote learning.

It is important to reinstate the significance of the social sciences by not only highlighting its increasing relevance for a job in the rapidly expanding service sector, but by pointing to its indispensability in laying the foundations for an analytical and creative mindset. It is often presumed that only natural and physical phenomena lend themselves to scientific inquiry, and that knowledge areas pertaining to the human sciences (history, geography, economics, political science etc.) cannot be, by their very nature "scientific". But it is necessary to recognize that the social sciences lend themselves to scientific inquiry just as much as the natural and physical sciences do, as well as to articulate the ways in which the methods employed by social sciences are distinct (but in no way inferior) to those of the natural and physical sciences.

The social sciences carry a normative responsibility to create and widen the popular base for human values, namely freedom, trust, mutual respect, respect for diversity, etc. Thus, social science teaching basically should be aimed at investing in a child a moral and mental energy so as to provide her with the ability to think independently and

deal with the social forces that threaten these values, without losing her individuality. Social Science teaching can achieve this by promoting children's ability to take initiative to critically reflect on social issues that have a bearing on the creative coexistence between individual good and collective good. Critical reflection pre-supposes a comprehensive curriculum in which learners—both teachers and children-participate in generating knowledge without any latent and manifest forces of coercion. It is through this non-coercive and participatory mode that children and teachers stand the best chance of making teaching and learning interesting as well as enjoyable.

Primary Stage

The objectives of teaching social studies at the primary stage are—

(a) To develop in the child skills of observation, identification, and classification.

(b) To develop in the child a holistic understanding of the environment with emphasis on the interrelationship of the natural and the social environments.

(c) To sensitize the child to social issues and develop in him/her a respect for difference and diversity.

Upper Primary Stage

The objectives of teaching the social sciences at the upper primary stage are—

(a) To develop an understanding about the earth as the habitat of humankind and other forms of life.

(b) To initiate the learner into a study of her/ his own region, state, and country in the global context.

(c) To initiate the learner into a study of India's past, with references to contemporary developments in other parts of the world.

(d) To introduce the learner to the functioning and dynamics of social and political institutions and processes of the country.

Secondary Stage

The objectives of teaching the social sciences at the secondary stage are to develop among the learner analytical and conceptual skills to enable him/her to—

- understand the processes of economic and social change and development with examples from modern and contemporary India and other parts of the world.
- critically examine social and economic issues and challenges like poverty, child labour, destitution, illiteracy, and various other dimensions of inequality.
- understand the rights and responsibilities of citizens in a democratic and secular society.
- understand the roles and responsibilities of the state in the fulfillment of constitutional obligations.
- understand the processes of change and development in India in relation to the world economy and polity.
- appreciate the rights of local communities in relation to their environment, the judicious utilisation of resources, as well as the need for the conservation of the natural environment.

Higher Secondary Stage

Ten years of general schooling offer a common scheme of studies for all students. The higher secondary stage is considered important as it offers a choice of streams to the students according to their need, interest, and aptitude. For some students, this stage may be the end of their formal education, leading to the world of work and employment; for others, this stage may be the foundation for pursuing higher education. They may choose either specialised academic courses or job-oriented vocational courses depending upon their preferences. The foundation laid at this stage should be able to equip them with basic knowledge and the necessary skill and attitude to make a meaningful contribution to any field they choose. The courses need to be designed and planned carefully, keeping in view the students' wide variety of preferences in order to make this a less stressful experience.

(a) to assist students to explore their interests and aptitudes in order to choose appropriate university courses and/or careers.

(b) to encourage them to explore higher levels of knowledge in different disciplines.

(c) to promote problem-solving abilities and creative thinking in the citizens of tomorrow.

(d) to introduce students to different ways of collecting and processing data and information in specific disciplines, and help them arrive at conclusions, and to generate new insights and knowledge in the process.

(e) The social sciences encompass diverse concerns of society and include a wide a range of content, drawn from the disciplines of history, geography, political science, economics and sociology. The selection and organisation of material into a meaningful social science curriculum, enabling students to develop a critical understanding of society, is therefore a challenging task. The possibilities of including new dimensions and concerns are immense especially in view of the student's own life experiences. It is important to reinstate the significance of the social sciences by not only highlighting its increasing relevance for a job in the rapidly expanding service sector, but by pointing to its indispensability in laying the foundations for an analytical and creative mindset. It is often presumed that only natural and physical phenomena lend themselves to scientific inquiry, and that knowledge areas pertaining to the human sciences (history, geography, economics, political science etc) cannot be, by their very nature "scientific". But it is necessary to recognize that the social sciences lend themselves to scientific inquiry just as much as the natural and physical sciences do, as well as to articulate the ways in which the methods employed by social sciences are distinct (but in no way inferior) to those of the natural and physical sciences.

5.3 NEED OF STUDYING SOCIAL SCIENCE THROUGH INTER-DISCIPLINARY PERSPECTIVES

The World is Interdisciplinary. According to The National Council for Teachers of English (NCTE 1995) "educational experiences are more authentic and of greater value to students when the curricula reflects real life, which is multi-faceted rather than being compartmentalized into neat subject-matter packages." In their view, real-world problems are complex, so no single discipline can adequately describe and resolve these issues. As a result it is evident that interdisciplinary learning is becoming more and more prevalent and is accepted in all stages of learning.

The goals of modern learning are engaging students and helping them to develop knowledge, insights, problem solving skills, self-confidence, self-efficacy, and a passion for learning. To achieve these objectives educators are more and more adopting interdisciplinary approach because—

- It develops ability for critical thinking.
- It helps students to tolerate ambiguity and understand different perspectives of a single issue.
- The students become aware of their personal bias and preconceptions.
- They also appreciate the ethical and moral dimensions of social issues.

Significant Learning (Fink, 2003) takes place when meaningful and lasting classroom experiences occur. According to Fink when teachers impart students with a range of skills, and insights about the educational process that students will see as meaningful and salient to them they promote student engagement in the learning process and greater learning occurs. Fink identifies 6 elements of the educational process that lead to *significant learning* and each of these is a common feature of interdisciplinary forms of instruction.

- Foundational Knowledge—acquiring information and understanding ideas

- Application—acquiring an understanding of how and when to use skills
- Integration—the capacity to connect ideas
- Human Dimension—recognition of the social and personal implications of issues
- Caring—acknowledgment of the role of feelings, interests, and values
- Learning *How-to-Learn*—obtaining insights into the process of learning

Social sciences are inherently interdisciplinary in nature. The historical events cannot be understood unless one knows the roles people played at that time (sociology). Their aspirations and need motivated them to do what they did at that time (Psychology). Their spiritual values (religion) determined their behavior. The knowledge of political governance and social anthropology of a certain era gives insight into the particular historical events. The material needs, resource utilization and wants or economics are to be studied if one seeks to develop insight and understanding of history. Interdisciplinary approach in social science may take many forms like integration of subjects, correlation study or creating thematic units. Modern social issues and problems like social unrest, terrorism, gender disparity, environmental degradation, climate change, poverty, state terrorism and many such phenomena can never be addressed without inter-disciplinary perspectives.

5.4. PLACE AND RELEVANCE OF SOCIAL SCIENCE IN SCHOOL CURRICULUM

The learning social science develops various coping skills apart from its market value. The following are advantages of teaching social science—

- It helps the students to function in real world by means of social skills and by learning adaptive social interaction–

- The students learn to respect differences of opinion, lifestyles and culture.
- The Constitutional values like equality, fraternity liberty are learnt and appreciated.
- The students understand the society in which they live and the need to transform and redirect it for social development.

Thus social study as school subject seeks to develop children as active, responsible members of the democratic society.

The Importance of Studying Social Science in School

The study of social science has great impact on young minds. It gives ideas as to the nature of the world we live. The science helps the students to know about physical feature of the world but social science opens up of the mind of the learner and ultimately develops his civic competence. As US president Thomas Jefferson said with the knowledge, skills and attitude gleaned from social science, the student assumes the office of the citizen as he grows up.

The learning social science develops various coping skills apart from its market value. The following are advantages of teaching social science—

- The students gradually learn to take informed decisions regarding various social issues like health care, crime, migration, foreign policies. They learn to tolerate diverse culture and different ethnic culture. Thus it helps the students to function in real world by means of social skills and by learning adaptive social interaction among individual and group. They also learn about power, authority, governance, production, distribution and consumption. Most importantly the complex relation among science, technology and society (STS) is made clear to them by the study of social science.

- The students learn to develop a sense of history when they study social science. They understand their role in society. It helps them to realize how the institutions, traditions and ideas change and the society is transformed along with the process of modernization. Their ability for critical thinking develops when they grasp the relation between individuals, groups and the nation.
- Social science teaching imparts citizenship training they learn about electoral process, voting, volunteering, branches of government, type of government, political participation and the Constitutional values like equality, fraternity, liberty are learnt and appreciated. The students also develop the insight in to the background of current issues like health care, mechanism of equality and inequality within our society and other forms of exclusion in the society.
- Making a living is also related to the study of social science. The students understand about the four important factors namely land, labour, capital and entrepreneurship. They become aware of the services and goods available for consumers. From the study of Economics they also learn to handle their own finances and decide on their future career options.
- The skills learnt from the study of social science can be used across the curriculum in learning other subjects. Reading and writing skills, ability for analytical skill, ability for drawing inference or forming logical opinions learnt from the study of social science can be successes fully applied in learning and understanding matters in other subject areas.
- The students understand the society in which they live and the need to transform and redirect it for social development. Social study helps the students to understand the process of interaction. The connection between past, present and future becomes apparent to them.

- Another skill developed through social study is ability to interpret the information. In the age of intense media coverage it is very important that people correctly learn about facts and real issues instead of unduly influenced by lies and propaganda. Insight developed from the study of social science helps the students to learn to sieve correct information from misinformation and news as a part of yellow journalism.

Thus social study as school subject seeks to develop children as active, responsible members of the democratic society. Teaching social study may seem to be easy as the social issues and processes surround us and we are always in close contact with them. But this notion is deceptive and its teaching is far from easy. Social science is not given due importance and it is often considered as step sisters of science. It is accepted as soft, trivial and meant for the weak. Social sciences in school are expected to teach about everything from maintaining the cleanliness of streets to understanding of the pluralist vision of the nation. Apart from teaching methodology the quality of social science textbooks has been questioned. They are alleged to be dull, uninspiring and meant for rote learning. The problems of teaching social science in school have been attributed to poor quality of textbooks, absence teacher education and examination system based on rote learning. The textbook should not be narration of the facts of linear monologue but be framed on a dialogic style encouraging active participation of the students. The information from them should be accessible and easy to understand.

Questions

☛ Objective type (2 marks)

Q.1. Define the term 'social studies'?

Ans. The term "social studies", in elementary and secondary education, includes sociology, history, political science, economics, religion, geography, and anthropology. Social sciences also contain subject matters from all these

disciplines. The objectives of both are also same. The basic objectives of these disciplines are to develop civic competence of the future generation. The National Council for the Social Studies in America has defined social studies as the integrated study of social sciences to develop among students the knowledge, skills and attitude required to function in a democratic republic.

Q.2. Define 'Significant Learning'.

Ans. Significant Learning (Fink, 2003) takes place when meaningful and lasting classroom experiences occur. According to Fink when teachers impart students with a range of skills, and insights about the educational process that students will see as meaningful and salient to them they promote student engagement in the learning process and greater learning occurs. Fink identifies 6 elements of the educational process that lead to significant learning and each of these is a common feature of interdisciplinary forms of instruction.

Q.3. Define social science as a discipline.

Ans. Social sciences deal with the socio-cultural aspects of human behavior. It is defined as the scholastic discipline or scientific field that investigate human society, that is man and his relationship with other men and environment. It follows scientific method to acquire knowledge of the characteristics of human beings, their culture and all the aspects associated with their physical environment.

Q.4. What is the subject matter of social science?

Ans. Indian Council of Social Science Research mentioned the names of the following subjects within the broad ambit of the discipline social science.

• Economics • Commerce • Education • Management • Business Administration • Political Science • International Relations • Psychology • Public Administration • Sociology • Criminology • Social Work • Anthropology • Demography • Geography • History • Law • Linguistic.

Q.5. What did NCF (2005) suggest regarding teaching of social science?

Ans. The NCF made important suggestions regarding teaching methods of social science. The interactive method is the best approach to develop creativity and critical thinking. The teaching is not giving information only rather the focus should be debate and discussion. The concepts need to be cleared through lived experiences of the individuals and community. The projects are effective means of social science teaching but NCF cautioned against the use of readymade project materials available in the market.

Q.6. Mention any two importance of studying social science in school.

Ans. Two importance of studying social science are–the students learn to take informed decisions and they learn to develop a sense of history when they study social science.

Q.7. Why is social science often taken as a nonutility subject?

Ans. Because, it is supposed to have less job prospect than the other science subjects. As such its economic implication is less than the other utilitarian subjects.

Q.8. What is the contribution of post modernism on social science?

Ans. Post modernism forces the social scientist not to look for pattern, structure or laws that transcend history or culture. For post modernists to understand societies local and contextual elements must be taken into consideration.

Q.9. What is the quantitative approach to social science?

Ans. Quantitative approach to social science means using statistical and other research techniques to describe, analyze and interpret different social science issues. It helps in measurement and prediction of human behavior.

Q.10. Give one desirable characteristic of social science textbook.

Ans. The social science textbook should be interactive and content should reflect the real life situations.

☛ Short type/Short note (5 marks)

Q.1. Mention how different subjects have been merged in the disciplines of education

Ans. Page 144. Scope of social science

Q.2. Write short notes on scope of social science

Ans. Same as question 1

Q.3. Discuss the suggestions given by NCF (2005) in the context of social science as school subject.

Ans. Page No. 152 sub unit 5.3

Q.4. Trace the history of development of social science

Ans. Page No. 149-150

Q.5. Write about philosophy of social science.

Ans. Page No. 150 Philosophy of social science

Q.6. Differentiate between social science and social studies.

Ans. Page No. 143. Social science and social studies.

Q.7. Mention any five importance of social science.

Ans. Page No. 161-163

Q.8. Write a short note on nature of social science.

Ans. Sub unit 5.2

☛ Essay type (10 marks)

Q.1. 'Social Science as an Area of Study'–Why? Discuss.

Q.2. Write about the Need of Studying Social Science through Interdisciplinary Perspectives.

Q.3. Discuss the place and relevance of social science in school curriculum.

Q.4. Write a note on importance of teaching social science in school.

Q.5. Explain nature and philosophy of social science.

(Answers to all the these questions can be obtained from the short answer questions only explain them in detail.)

PRACTICUM

The trainee teachers are to select any two practical activities from the following—

1	Writing term paper or position paper. The teachers may consider the following topics- (a) Science curriculum at different stages of school curriculum (Ref;www.ncert.nic.in/science.pdf (b) Complex scenario of science education (not equity based, does not encourage inventiveness or curiosity,overpowering exam system, emphasis on rote learning instead of inquiry skill, investigative ability not encouraged). (c) Humanities in a changing environment (d) Mathematics as Masculinist Domain (e) How sexism pervades language. The teacher educators may suggest other related topics.	The paper should be written individually within 1000 words. Bibliography/ references to be given. The content should have introduction, main points and conclusions/ suggestions. Can be written or typed. Written assignment will be preferred.	To be evaluated by the teacher educators on the basis of the following-clarity of thought, critical analysis, and logical conclusion. The papers are to be preserved as although it is internal assignment the external examiner may want to sample check.

2	Textbook analysis- Science, social science, language and mathematics textbooks are selected and its contents analysed.	Any one text is selected and its content may be analysed on the basis of the following aspects— (i) How the Units/ subunits are arranged. (ii) Whether language is lucid and suitable for that age group (iii) Diagram/ flowcharts, pictures, tables etc are given (iv) Any error, correct content (v) Self check questions etc.	The teacher educator will evaluate it on the basis of the rubrics given in the left column.
3	Group Discussion—5 trainee teachers take part in group discussion. Sample topics- Role of ICT in science education,Equity and Science Education, Poor linguistic skills,Organization of science fair , Mock Parliament, Climate Change etc.	Each member of the group will be give 10 minutes to talk about a particular aspect of the issue. A rapporteur will take down the notes and another member will take over when rapporteur speaks. The proceeding may be photographed	The trainee teacher will be evaluated on the basis of his fluency, logical arguments , correct pronunciation etc

4	Preparing worksheet on any three topics from a particular textbook		
5	Trainee teachers from science group may be given the assignment of writing on importance of teaching social science in schools and vice versa. Similarly language group trainees are required to write about importance of learning mathematics .		

Assignment, Seminars, Term Papers, Textbook analysis, Group Discussion writing position papers on science, language mathematics and social science.

Trainee teachers from science group may be given the assignment of writing on importance of teaching social science in schools and vice versa.

Group discussions on interdisciplinary nature of education and every trainee teacher will be assessed on the basis of her/ his presentation. The concerned teacher may keep the records of such group discussion which will be scrutinized by the external examiner (suggestions invited)

Demonstration lecture may also be organized to evaluate the trainee teacher's skill in integrating different subjects while teaching a particular topic.

Preparing work sheet on any three topics of a school subject

Writing position papers on science.

Or social science or mathematics.

HOW TO WRITE A TERM PAPER

"A term paper is a research paper written by students over an academic term, accounting for a large part of a grade." A term paper is an original written work of a student generally intended to describe an event, a concept, or argue a point:

"There is much overlap between the terms research paper and term paper. The phrase term paper was originally used to describe a written assignment (usually a research based paper) that was due at the end of the 'term'-either a semester or quarter, depending on which unit of measure a school used. However, not all term papers involve academic research, and not all research papers are term papers."

A term paper is usually assigned to students so that they

- Delve into the intricacies of a specific topic far beyond what is possible by a teacher or one particular text.
- Increase their expertise in some particular substantive area.
- Sharpen their analytic and writing skills in preparation for the professional career.

GUIDELINES FOR WRITING A TERM PAPER

1.Choosing a topic

If you are given the freedom to choose a topic, choose a topic which caters to your interest. Make sure that the topic fits the length of the paper you intend to write. Consult your supervisor to expand the periphery of your topic or to trim it down. Your term paper should have adequate dimension to cover a length, say, of 1000 words. The research resources must also be available to you.

2.Getting Started

Before writing the term paper, you need to research on your topic.

(a) At first read one or two general books on your topic. This will give you an initial grasp on your topic.

(b) Try to look for a variety of sources when you are searching the library catalogue or web resources. If, for example, you are doing a paper on Vietnam, do not only look under "V" for Vietnam. Other likely subject headings might be

Asia, Southeast; Ho Chi Minh; Kissinger, Henry; Johnson, Lyndon B.; Nixon, Richard M.; U.S.-Foreign Relations; or U.S.-History.

(c) Recent articles in journals and books contain bibliographies which can guide you to an invaluable source material.

(d) Make your notes or photocopy and make a careful and complete notation of your source material.

(e) You must learn how to use your sources in your term paper.

3.Citations and References

All good research papers rely on information compiled by and analysed by others. If you write a research paper without consulting other works, then you have written an essay, not a report. If you do rely in part on the work of other people and you do not cite them, you have failed in your responsibilities. A research paper must cite the work of others. Without complete citations the researcher becomes a victim of plagiarism.

Plagiarism is the theft of the thoughts, facts, or knowledge of others by not giving them proper credit.

Given below are some guidelines you can follow to protect yourself:

1. Whenever you are quoting or paraphrasing the thoughts or work of others, you should cite the source.
2. Commonly known facts need not be footnoted.
3. Whenever you are in doubt whether a piece of information is commonly known or not, it is safest to mention the source.

Citations used in endnotes, footnotes and bibliography should follow a correct format. Endnotes and footnotes are indicated with numbers in the term paper and the corresponding information against each number is given at the bottom of the page (footnote) or at the end of the paper (endnote). At the end of the paper the bibliography repeats the full list of all the sources.

Bibliographies follow a formatting style. A reference-in-text style uses the author's name and the year of publication of the

work, which are placed in parentheses and inserted at the appropriate place in the text. A page number is also included for direct quotes and in some other cases.

4. Organisation

- Unify your ideas into a clear presentation.
- Synthesize. Draw together diverse things to show relationships between ideas.
- Organize. Give logical continuity and structure to diverse ideas so that they follow a pattern.
- Analyse. Provide critical analysis in which arguments are examined for evidence, validity, logic, and flaws.
- Clarify. Make evidence and arguments clearer to the reader. Elucidate difficult material.
- Examine in a broader context. Show how a specific subject fits into a broader context, relates to another field, or relates to historic precedents.
- Select and distil. Weed out irrelevant materials to get at the main issues of a complex subject.
- Adopt a point of view. Show how the preponderance of evidence and reason favours one side in a controversial issue.

MECHANICS AND STYLE

- Proof-read your paper carefully for correct spelling and grammar.
- Read it critically for form and content.
- One mark of good style is ease of reading. If you can read something aloud without stumbling or hesitating, that's a good sign.
- Purge 'flabby' words and vague expressions.
- Substitute words with specific, precise and clear meaning-the meaning you intend to convey, not some other meaning.
- Active, simple and direct expressions are best.
- Avoid colloquialisms unless they are necessary to make your point.
- Avoid emotion-laden words and phrases.
- Leave out superfluous words; unnecessary intensifiers and clichés.

- Find your natural style-don't imitate the writing style of others.

HOW TO FRAME A WORKSHEET

A worksheet is a paper listing questions or tasks for students. As a teacher you need to prepare topic specific worksheets so that you can ensure the participation of the whole class in your lesson.

A worksheet can be used in the introductory phase of teaching to–

- Secure attention
- Contextualise the forthcoming learning experience
- Assess the previous knowledge of the learners
- Arouse motivation

A worksheet used in the interactive phase of teaching can be used to–

- Challenge the learners to predict the final outcome
- Recapitulate what preceded
- Relate the ideas and concepts to what will follow
- Sustain motivation
- Develop ideas from the known to the unknown

A worksheet used after the completion of the lesson or unit is used to–

- Measure the attainment of the objectives
- Evaluate the achievement of pupils
- Relate the present topic with future learning

A worksheet looks like a composite question paper where the teacher asks a question or frames a task and provides space for students to answer.

Questions may be of the Fixed Response Type viz. Multiple Choice; Fill in the blanks; Match the following; True-False; Analogy; or Free Response type where short questions are asked.

In junior classes worksheets are designed in various shapes compatible to the topic concerned to create interest in the learners.

Effective use of worksheets ensures an active and participative classroom environment.

APPENDIX

Meaning of 'Metacognition'

Metacognition means cognition about cognitive processes. It implies an individual's ability to know about his own cognitive processes. Apart from knowledge about these processes metacognition helps the individual to control his own mental processes like organization, monitoring and modifications of thought processes which in turn help in learning. Besides metacognition is related to a person's reflection on task demands. On the basis of this reflection he employs effective and appropriate learning strategies regarding reading writing or doing mathematics.

Difference between subject and discipline

Discipline and subject are often used interchangeably but there are some differences between the two terms.

Discipline is broader in scope as it means a branch of academic study whereas subject refers to a particular branch of knowledge studied or taught.

A discipline trains academics and specialists but subject seeks to give knowledge in tune with overall educational purpose.

Disciplines are usually imparted at higher level of education like universities but subjects are more commonly taught at lower level of educational institutions like schools.

Interdisciplinary barriers between Social Science and Natural Science

Essentially social sciences deal with human activities and their characteristics, psychological traits and interaction between environment and cultural aspects. On the other hand natural sciences study the natural surroundings of the earth and its resources and how the natural resources should be used and what should be done with them. Sciences further seek to improve built environment and human activities.

Natural sciences basically describe, predict and seek to understand various natural phenomena. The methods in this regard are observation and gathering of empirical evidence. Social sciences having a number of branches deal with society, its relationship with individuals and relationship among individuals of different categories.

In other words universe and its working is the subject matter of natural sciences but the human behavior is the subject matter of social sciences. The two types of sciences are linked by the study of brain and cognitive sciences but we are yet to understand properly why people behave in a particular manner or it is very difficult to predict human behavior unlike physical events. The study of human behavior and its prediction is all the more difficult because due to ethical and other practical reasons it is not possible to carry out double blind controlled experiments (the important methods of natural sciences) in case of social sciences. The social sciences now claim to be empirical and follow experimental methods but by their very nature they are descriptive in nature.

For example a simple term like 'desk' itself does not provide much information. But if its measurement, shape, colour, and its material are provided with then a definite meaning of the desk is obtained but the words like 'socialism', 'capitalism' remain vague unless they are properly defined. Again these definitions may not be universally accepted but in natural sciences this type of vagueness is not so pronounced, although natural scientists too fail measure natural phenomena with absolute accuracy. However in case of social sciences errors of measurement are larger in comparison to natural sciences.

Thus there inter disciplinary barriers between the two types of sciences but social scientists are trying their best to make social sciences as empirical as possible to close the gap between the two.

Science is a Method of Inquiry

Scientific method is a technique which used to study a phenomenon. Therefore it is a method of inquiry. The objective is to acquire new knowledge or correct and integrate with previous knowledge. Man is inquisitive by nature so he is curious to know about things and develop ideas.

The steps of scientific method are based on rules of reasoning and were first introduced by Rene Descartes in 1619. It is based on critical thinking. Its objective is to eliminate personal or social or unreasonable influences. The number of steps of scientific method may vary and the some essential steps are discussed below—

- **Observation:** The first step in scientific inquiry is observation. A phenomenon or problem is observed or

encountered and the individual becomes motivated to learn about it. Sometimes the interest or inner wishes make individual observe something minutely.

- **Questions:** While observing a phenomenon the enquirer raises relevant questions related to it. The questions like this "why sky is blue?' The question can be open ended also. For example what can be done to solve the problem of drop out in elementary education?
- **Hypothesis:** Hypothesis is tentative answer to the research questions. It is an educated guess, hunch or conjecture which has to be verified to solve the problem. The scientific method is based on hypothetical deductive model. To frame hypothesis one has to go through related literature. It should be consistent with present knowledge and led to further enquiry. Another interesting aspect of hypothesis is that a false hypothesis may be accepted at a later stage of development.
- **Prediction:** Hypothesis leads to prediction showing the relation between dependent and independent variables. It implies that something (1) will happen when something (2) is manipulated.
- **Experiment:** The next and important step in scientific method is experimentation. It signifies whether real world behaves in the same way as predicted. Testing and experimentation may be conducted in laboratory, field and blackboard or in computer even on kitchen table. The experiment to be free of bias must be done in controlled condition.
- **Evaluation:** Evaluation is the integral part of scientific method. Evaluation is very comprehensive in the sense that all aspects of scientific methods like experimental procedure, examination of the evidence, identifying the faulty reasoning, examining the statements that go beyond evidence and alternative explanations for same observation are scrutinized and subject to critical analysis.

Basic Characteristics of Scientific Attitude

Scientific attitudes refer to the behavioral dispositions expected in individuals who intend to become successful scientists. Scientific attitudes include respect for evidence, honesty, creatitivty, flexibility, curiosity, objectivity and skepticism.

1. Empiricism.
2. A belief that problems have solutions.
3. Parsimony.
4. Scientific manipulation.
5. Precision.
6. Respect for paradigms.
7. Willingness to change opinion.
8. Aversion to superstition and an automatic preference for scientific explanation.
9. A thirst for knowledge, an "intellectual drive.
10. Ability to separate fundamental concepts from the irrelevant or unimportant. .
11. Respect for quantification and appreciation of mathematics as a language of science.
12. An appreciation of probability and statistics.
13. An understanding that all knowledge has tolerance limits.
14. Empathy for the human condition.

Meaning of Syllabus

The term syllabus comprises teaching learning materials, equipments, tools and also different aspects of evaluation system. Syllabus has to do with learning process and its planning. It also contains what are the items of learning, whether they are available, sequential arrangement of the learning items, time allotted for learning different items. The syllabus also specifies the simultaneous learning of some related items. Any syllabus is continuously scrutinized by stock checking, testing and examinations.

The main ideas of syllabus may be summarized below:

1. A syllabus is prescribed by a particular department, college or any other educational institutions. Often the syllabus is divided into subsections and allotted to different classes or group of students.
2. In practice it relates to time frame, semesters, terms, and weeks of study or courses. The allotment of time for different components of study is often teacher directed rather than the requirement of the learners. Ideally syllabus should be framed on the basis of students' previous level of learning, the final objectives of learning and the students' inherent ability of achieving the learning goals.

3. Sequencing of learning materials within syllabus is essential. This sequencing often based on the needs of the administrators rather than needs of the students.
4. The syllabus is devised for the convenience of the administration. It is negotiable and adjustable containing useful experiences reflecting the necessities of the present time.
5. A syllabus directs what is to be taught but its transaction is altogether a different matter depending much on the personalities of the learners and teachers.
6. The syllabus is an important ingredient of democratic system of education.

What are the problems of Language Development

Children learn languages quite spontaneously. But some children do show certain problems of language development like the following:

- Speech sometimes lack grammatical and functional morphemes—it is like telegraphic speech.
- Vocabulary remains relatively small and the child has problems in understanding complex and figurative structures.
- Articulation disorder problems like omissions, substitutions, distortions or additions may be present in the child's speech. There may be voice disorders.
- Some children stutter and stumble.' Stuttering'results in repeated or prolonged speech sounds or syllables. Often, involuntary blocks in fluency will be accompanied by muscle tension due to frustration. The mouth may tighten up or the eyes may blink rapidly. He may become so embarrassed by stuttering that he reduces his speech to a minimum, talking as little as possible to avoid the struggle. This may have serious academic and social implications.'
- Inability to express in speaking or writing is a problem that starts when the child does not develop receptive language skills.
- Ambiguities in pronunciation, spelling, concept development are some other problems.
- Overemphasis on writing prematurely leads to problems in language development.
- Blocks due to genetic impairment and emotional turbulences are also causes of poor language development.

The teacher's and parent's job is to recognise problems in language development. Aparental guide offers the following directions:

- Look for poor eye contact and lack of attention and focus."
- "Listen to how they pronounce words. Are they hard to understand?"
- "Can they understand simple directions?"
- "Are they having trouble with basic social skills?"
- "Does the child not seem to be interested when you read to them?"
- "Do they repeat what you say or say the same thing over and over?"
- "Do they lack empathy for the feelings of others?"
- "Do they avoid conversations?"
- "Are they only interested in talking or reading about one subject?"

Such symptoms, when detected have to be related with problems in language development- phonemic, semantic, stylistic or pragmatic. They are to be mitigated in a trauma-free environment and specialists in the field are to be consulted, if required.

Problems in language development may be in the form of disorders like Dyslexia and Dysgraphia Dyslexia has been defined 'as a disorder in children, who despite conventional classroom experience, fail to attain the language skills of reading, writing and spelling commensurate with their intellectual abilities.' Dysgraphia is a specific writing disability, not associated with the ability to read, or due to intellectual impairment. Such disorders need professional diagnosis and proper expert treatment.

The Roles of Teacher in Language Development

The teacher helps the child to:

- Explore interesting objects, sounds, phenomenon, nature etc.
- Describe facts, concepts, principles and procedures
- Narrate events, anecdotes, happenings and stories.
- Argue, agree, disagree, debate
- Write sentences coherently, frame paragraphs coherently, formulate expository essays etc.
- Take part in discussions and conversations.
- Involve in co-operative group work.

The teacher's role is like a resource-manager, a stage-setter where learners hone up their language skills—Listening, Speaking, Reading and Writing. (For details on integration of language skills see page 100)

The teacher designs learning experiences to illustrate, useand apply the different language functions (for details See page 97 & 107)

The teacher diagnoses problems in language development and takes appropriate measures for remediation.

Application of Language Development at School Level

Language is absolutely central to learning: without it, we cannot make sense or communicate our understanding of a subject.Hence it is absolutely necessary to have proper language development at the school level.

We need to develop our language skills, and specifically, academic language, in order to:

- Understand and make the most effective use of our study materials and text books
- Develop the specialised language and vocabulary relevant to our subject
- Interpret questions and select relevant and appropriate material for our response
- Write well-structured and coherently presented answers and assignments
- Communicate our needs to our teachers
- Work productively with other students.

In school, language development is vital for:

- Knowledge and understanding of the principles, concepts and terms central to the subjects
- Developing analytical skills
- Developing communication skills
- Develop information literacy (Develop skills in finding, selecting and using data in defined contexts at the outset and finally to complex contexts)
- Learning how to learn (Develop awareness to become a self-learner and plan, monitor and evaluate one's own learning using metacognitive strategies.)
- Develop personal and professional skills to use in later career and profession.

Relationship between Intellectual Development and Language Development

Refer to Pages73, 74, 75 for Piaget's and Vygotsy's views on Language development and conclude in the following way:

A quick look at the brief account provided, shows that Piaget's theory is grounded in scientific and epistemological (how do we know what we know) understanding of how children's knowledge of the world develops. There is no doubt that his work is important for the investigation of intellectual development. It describes the nature of cognitivedevelopment. However, children need more than experiences with the environment; they also need to interact socially. Nevertheless, Piaget (1969, cited in Vygotsky, 1986) himself asserts, "If there were no other people, the disappointments of the experience would lead to overcompensation and dementia. We are constantly hatching an enormous number of false ideas, conceits, utopias, mystical explanations, suspicions, and megalomaniac fantasies, which disappear when brought into contact with other people. The social need to share the thought of others and to communicate our own with success is at the root of our need for verification. Proof is the outcome of argument...". Meanwhile, language accelerates cognitive development. Therefore, Vygotsky's theory, more or less, complements that of Piaget's to perfection by adopting innovative orientation to the role of language in the development of intellect. Vygotsky's theory suggests that language is more important than what Piaget implies. In Vygoytsky's view through language, we construct reality. Without the words to think and communicate, our lives would be very different from what it is. He places more emphasis on the role of language, culture and social factors in shaping cognitive development.

Becker and ***Varelas*** (2001) conclude, "Through his early ideas on language, Piaget offers an avenue for extending Vygotsky's approach to the interplay of conceptual and semiotic aspects in intellectual development". Indeed, before acquiring language, the child is able to convey her/his purposes and wishes by pointing to objects. The child first recognizes things, and then learns to make use of language. Therefore, neurologically, cognition is the basis with different processes, (perception, intelligence, imagination, intentionality, memory, creativity...). One or the complex processes, which makes endeavour to express intention, reveals itself through language, through nerve system

and speech organs. When the child masters his/her mother tongue through interacting with others, language helps in intellectual functioning. Concisely, thought originally leads way to language, then language leads way to thought as well and the circle continues throughout all of life. The idea is that, "the relation of thought to word is not a thing but a process, a continual movement back and forth from thought to word and from word to thought (***Vygotsky,*** 1986). Despite, "many of the thoughts we are capable of are not completely determined by our language" (Whitney, 1998).

So both Vygotsky and Piaget recognized the complementary nature of cognition, social interaction and language, as well as the complex nature of development. However, they had different emphases in their theoretical propositions.

'Piaget emphasized on maturational processes in the developmental route. Vygotsky stressed on the socio-historical mediation of meaning from social context to individual realization."Another important concluding point is that from phylogeny view (evolution of species), the distinction between human beings and other species is located in human's higher intellectual ability, which is empowered by primary psychological tools such as language. That is "Our ability to use language to transmit our thoughts to others has been crucial to the survival or our species"(Whitney, 1998). Finally yet important, on the relationship between language and thought Vygotsky reminds that: "thought undergoes many changes as it turns into speech. It does not merely find expression in speech; it finds its reality andform." (***Golub*** and ***Reid***, 1989)

Relation between Mathematics with Physics

Mathematics is the study of relationships among quantities, magnitude and properties and also of the logical operations by which unknown quantities, magnitudes and properties may be deduced. Essentially it is the study of quantity, structure, space and change.

Physics is the study of matter and its motion through space-time and the derivatives, such as energy and force. Physics deals with a wide range of phenomena, from the smallest sub-atomic particles, to the largest galaxies. Physics intends to connect the things we see around us to root causes, and then to try to relate these causes together in the hope of finding an ultimate rational analysis of nature.

The two subjects have been related to each other closely from the very beginning of their study. In a sense they are two way processes. Mathematics as a language of physics seeks to express, explain and develop physical concepts and theories. On the other hand physical concepts and arguments and modes of thinking are components of mathematics. Thus physics is domain of application of mathematics where problems are provided to be solved with the help of mathematical tools. Physics also offers ideas, methods and concepts which help to create new mathematical concepts, methods and theories. The history of mathematics and that of physics are related and dependent on each other. One is incomplete without the other. The difference between the two subjects is of general attitudes towards description and understanding of different objects. The historical relation between the two should not be ignored especially when these subjects are taught in the class. The topics can be integrated and taught in a holistic manner. For example geometric and algebraic concepts can be discussed along with Relativity Theory and Quantum mechanics.

Relation Between Mathematics with History

There is reciprocal relationship between History and Mathematics. The historical studies make it possible to know about various mathematicians who were the great scholars in their field and developd mathematics by their contributions. History also furnishes information information about the origin and development of mathematics. Mathematics on the other hand helps history in calculating dates days and time period etc. of various historical events.

Acquiring of time frame and development of time sense in history is based on the understanding of mathematics. Thus the two subjects are related to each other. However the History and Mathematics as subjects are different as far as contents are concerned. Mathematics is generally considered to be dry subject and require more ability for abstract thinking and comprehension, while history is supposed to be a social science subject, sometimes interesting requiring less demand on abstract thought processes.

Mathematics in Aesthetics

Mathematics is often considered as mechanical, cold and unimaginative. It is allegedly a subject related to memorization of formula and equation and mechanical manipulation of

numbers. As such mathematics and aesthetic are difficult to be associated with each other. But aesthetic significance of Mathematics has long been recognized by the renowned mathematicians. But mathematics has its own elegance and beauty as the magic of mathematics is appreciated by the researchers. As ***G H Hardy*** said that a mathematician, like a painter or a poet, is a maker of patterns. ... The mathematician's patterns, like the painter's or the poet's, must be beautiful; the ideas, like the colours or the words, must fit together in a harmonious way. Beauty is the first test: there is no permanent place in the world for ugly mathematics. The beauty and elegance of mathematics develop an aesthetic emotion. The motivating force of mathematics is its beauty.

One of the most compelling beauties of mathematics is its refined austerity. It is graceful which is unique among the arts. Its essence lies in its precision. Dewey mentioned that aesthetic is a pervading quality of human reasoning and experience. Therefore mathematics has its own aesthetic value. Its beauty is of different type as Russell said Mathematics, rightly viewed, possesses not only truth, but supreme beauty—a beauty cold and austere, like that of sculpture, without appeal to any part of our weaker nature, without the gorgeous trappings of painting or music, yet sublimely pure, and capable of a stern perfection such as only the greatest art can show. The true spiritual delight, the exaltation, the sense of being more than man, which is the touchstone of the highest excellence, is to be found in mathematics as surely as poetry. The moving power of mathematics is imagination.

But students often are unable to appreciate the beauty and elegance of mathematics. This is why mathematics education occasionally fails in its objective of helping students learn the concepts. The affective domain of mathematics education is important regarding the motivation and anxiety related to learning mathematics.

Two Advantages of Silent Reading

Benefits of effective silent reading include steady improvement of educational efficiency; exploration of a wide variety of reading material; learning how to read with purpose; and confidence in dealing with all forms of reading, whether for school, business or leisure.

Scientific Heritage

Scientific heritage is the legacy of the community of scientists. It is collectively shared by the group of scientists. It is totality of scientific knowledge, to which the scientists identify themselves and want to pass it on to next generation of scientists and to the general public as well. It comprises what we know about life, nature and the universe; it also includes how this knowledge is generated. The knowledge is transmitted both by material and non material media. Scientific heritage comprises artefacts and specimens, However, laboratories, observatories, landscapes, gardens, collections, research and teaching practices and ethics, documents and books are also included in it.

Problems of Reading

Children diagnosed with learning difficulties generally have a problem with reading. Reading problems are neuro-developmental in nature and though it is difficult to completely obliterate this problem, it can be mitigated using effective strategies. The problem areas in reading are in the domains of Decoding, Comprehension and Retention.

1. *Decoding Difficulties*

Decoding is the process by which a word is broken into individual phonemes and recognized based on those phonemes. For instance, proficient decoders separate the sounds "cuh," "aah," and "tuh" in the word "cut." Someone who has difficulty decoding, and thus difficulty reading easily, may not hear and differentiate these phonemes. "cuh," "aah," and "tuh" might be meaningless to them in relation to the word "cut" on the page.

Experts have no one explanation for this phenomenon. In some cases, it may reflect that some people simply require more time to separate sounds—the time which the learner is not given by tutors.

2. *Signs of Decoding Difficulty*

(a) trouble sounding out words and recognizing words out of context
(b) confusion between letters and the sounds they represent
(c) slow oral reading rate (reading word-by-word)
(d) reading without expression
(e) ignoring punctuation while reading

3. *Comprehension Difficulties*

Comprehension relies on mastery of decoding; children who struggle to decode find it difficult to understand and remember what they read. Because their efforts to grasp individual words are so exhausting, they have no resources left for understanding.

4. *Signs of Comprehension Difficulty*

(a) Confusion about the meaning of words and sentences
(b) Inability to connect ideas in a passage
(c) Omission of, or glossing over detail
(d) Difficulty distinguishing significant information from minor details
(e) Lack of concentration during reading

5. *Retention Difficulties*

Retention requires both decoding and comprehending what is written. This task relies on high level cognitive skills, including memory and the ability to group and recall related ideas. As learners progress from one class to the next, they are expected to retain more and more of what they read. In high schools they are expected to read to learn.

6. *Signs of Retention Difficulty*

(a) trouble remembering or summarizing what is read
(b) difficulty connecting what is read to prior knowledge
(c) difficulty applying content of a text to personal experiences.

Apart from these problems related to reading, a serious reading disorder is found in learners showing symptoms of dyslexia—difficulties with automatic balance; immature motor skills; auditory processing problems; abnormal processing of visual information.

SAMPLE QUESTIONS

GROUP A

Very short/ objective type questions (for 2 marks)

1. Write the meaning of discipline. Given in the book
2. What is interdisciplinarity? Given in the book
3. What is transdisciplinarity. See the text book
4. Write two characteristics of discipline. See the text book
5. Mention two important objectives of science education. See the answers in the unit 2 of the book
6. What is ethical consideration in science? Given in the text book
7. Mention any two assumption of science. Given in the textbook
8. What is meant by curriculum? Mentioned in the book
9. Write the four elements of language.
10. What is phonology?
11. What is the aim of teaching second language?
12. Give one instance to show that language is "gendered".
13. Write two important characteristics of the discipline mathematics. See the text book
14. Write four names of Indian mathematicians. See the text book
15. What is Rhind Papyrus? Egyptian manuscript
16. Who was Muhammad Al-Khawaja? Wrote algebra textbook
17. Write any two importance of studying social science in school. given in the textbook
18. What is quantitative approach to social science? Given in the text book

19. Write any two objectives of teaching social science in secondary stage. Given in the textbook
20. What is the nature of social science? See the book
21. Define discipline. See book
22. What is interdependence amongst various schools subject? Interrelation and integration of subjects
23. What is integration with different subjects? Same answers
24. What is transdiscipline? Given in the book
25. What is law or theory? Irrelevant question Give definition of theory
26. What is scientific truth? Experimentally observed phenomena.
27. What are the factors of scientific spirit? Objectivity, experimentation
28. Mention the nature of experimental method? See text book
29. State two areas of language development during childhood. Irrelevant question not included in the subject
30. Mentions any two functions of language in learning. From chapter language
31. Write two purposes of including languages in the syllabus of Secondary Education.
32. State two recommendations of Kothari Commission as regards language education as secondary level.
33. What is mathematical model?
34. Write five names of Indian mathematician.
35. What is practical value of Mathematics?
36. Mention two ancient books of Mathematics.
37. Define Social Science.
38. State two differences between social science and social studies.
39. What are the steps of scientific method?
40. Write the main subjects of social science.
41. What is called Science?
42. Write any two difference between Science and Un-science? Unscience is pseudo science which can not be experimentally verified.

43. Define curriculum.
44. What do you mean by scientific law? Give example.
45. Why does nineteenth century called the golden era of modern scientific studies? Write about inventions and discoveries.
46. Write the difference between syllabus and curriculum. See text book
47. What is observation?
48. What is paradigm?
49. Write any two characteristics of an ideal science book?
50. What is scientific method?
51. Write the definition of social science.
52. Name the first book and the author of social science.
53. What is political science?
54. What is anthropology? Write the main branches of it. See book
55. What is sociology? Who is the founder of this subject?
56. Write the definition of discipline.
57. What is the regular structure of classification of discipline?
58. What is interdisciplinary?
59. What do you mean by multidisciplinary?
60. What is education?
61. What is mathematical model?
62. What is the practical value of mathematics?
63. Write the name of some Indian mathematicians.
64. What is language?
65. What are the components of language?
66. What is the role of language in communication of information?
67. What are the different theories of language development?
68. What are the recommendations of Radhakrishnan Commission on language education?
69. What are the objectives of language learning?
70. What do Aristotle mean by mathematics?
71. What is the difference between syllabus and curriculum?
72. Write the stages of curriculum construction.

73. What do you mean by curriculum evaluation?
74. What is content analysis?
75. What do you mean by knowledge construction? Write constructivism
76. What are the domains of learning? Why these questions? Not included in this paper
77. What is transfer of learning?
78. What do you mean by discipline?
79. Give two reasons behind the emergence of new discipline.
80. Define observation method.
81. What is hypothesis?
82. What is the difference between hypothesis and assumption?
83. What is telegraphic speech?
84. Write the stages of language development.
85. What is phoneme?
86. What is morpheme?
87. What is pragmatics in language?
88. Why is it said that mathematics is the gateway of learning science?
89. How does mathematics contribute to learning social science?
90. Write two importance of studying social science.

GROUP B

Short type questions (for 5 marks)

1. Mention any five characteristics of discipline.
2. Explain briefly the history of development of disciplines.
3. Elucidate the concept of nature of science.
4. Write a note on ethical consideration of science.
5. Explain the 3-language formula.
6. What are the aims of teaching languages in Indian schools?
7. Write short note on the contribution of Indian mathematicians.
8. Write short note mathematics in day-to-day life.
9. Mention any five importance of social science.
10. Explain the philosophy of social science.

11. Education as a Discipline—comments your view about the concept.
12. Discuss the causes of evolution about contents of School Education.
13. Explain the nature of science.
14. What is paradigm shift? Write shortly the principles of paradigm shift.
15. Discuss the 3-language formula mentioning the problems about it.
16. Explain the concept of 'language as a discipline'. How is it different from the concept of 'language as a subject'?
17. Briefly discuss about the nature of Mathematics.
18. Write in short about the place of Mathematics in School Curriculum.
19. State the fundamental difference between Natural and Social Science.
20. What are the functions of social science research?
21. Explain the nature of science?
22. "Nineteenth century is the golden era of modern science studies"-Justify your answer.
23. Write in brief the history of science education in medieval period?
24. Write a short note on science education in India.
25. What is paradigm shift? Write in brief the principles of paradigm shift.
26. Briefly discuss the socio-cultural perspective of science education.
27. Discuss the nature and characteristics of experimental method of science education.
28. Discuss the importance of science in school education.
29. How can we measure the validity of science in school curriculum?
30. Briefly discuss about the origin of social science.
31. Mention the role of positivism in social science.
32. Mention the importance of Marxism in social science studies. Irrelevant question

33. Briefly discuss the characteristics and nature of discipline.
34. Write short description about regular structure of classification of discipline.
35. Briefly discuss about the merging of various discipline into education.
36. 'Education is a process'-comments your view on the concept.
37. Give a short description about the various branches of mathematics.
38. Write in short about the place of mathematics in school curriculum.
39. Mention the stages of language development.
40. Write the language development theory of Skinner and Noam Chomsky.
41. Discuss the place of language in education and role of language in teaching and learning.
42. What was the debate over number of language in education?
43. Write the principles of curriculum construction?
44. What is integration of knowledge? Explain with an example.
45. Assess Education as a discipline.
46. Explain the concept of 'multidisciplinary approach'.
47. What are the basic differences between a science teacher's approach and a language teacher's approach in the classroom?
48. What are the steps in scientific approach?
49. Write short note on socio cultural perspective of science.
50. Write about the language policy at secondary level across India. Write merits and demerits.
51. Write short history of emergence of mathematics as a discipline.
52. Write short note on the philosophy of social science.

GROUP C

Broad type questions (for 10 marks)

1. Explain the interrelation amongst various school subjects.
2. Discuss with the help of a flow chart the steps in scientific investigation.
3. Discuss the phases of language development.
4. Discuss the relationship of mathematics with other school subjects.
5. Discuss the place and relevance of social science in school curriculum.
6. Education as interdisciplinary field of studies—Discuss the concept.
7. Analysis the observation as a process and mention the steps of the process.
8. Explain the concept of communication and discuss the role of communication in teaching-learning situations.
9. How Secondary School Mathematics can be connected to daily life situation?
10. Illuminate on the Philosophy of Social science.
11. Discuss the history of science studies in ancient, medieval and modern era.
12. Explain the context of science education in present day India.
13. Discuss the observation method of science education.
14. State the place of scientific knowledge in the scheme of school curriculum.
15. Discuss the contemporary ideas of paradigm shift in discipline. Discuss the contemporary and future position of science education.
16. What are the contributions of different scientists in science education?
17. What do you mean by science text book? What are the characteristics of an ideal science text book?
18. Enumerate the relation among curriculum, syllabus and text book in science education.

19. Discuss the importance of social science as an area of study.
20. Mention the characteristics of social science family members.
21. Education is a multidisciplinary field of study—discuss the concept.
22. Emergence of various disciplines into education—discuss with example.
23. Discuss about mutual relationship and interdependence of subjects in school curriculum.
24. Describe the history of mathematics.
25. Describe the relationship of other subjects with mathematics.
26. Discuss about language in school curriculum: aims, issues and debates.
27. Mention the recommendations of different commissions about language in school curriculum.
28. With an example explain how you can follow interdisciplinary approach in the classroom (Mention the class).
29. Describe briefly the history of development of disciplines.
30. Discuss the steps in scientific investigation.
31. What are the basic language skills? Write elaborately to develop any particular skill of a language.
32. Explain nature and philosophy of social science.
33. Briefly explain the nature of science (science as product and science as process).
34. Do you think that the scientific process is one of the best processes in science teaching?

All these questions can be answered from the textbooks and some questions are definitely out of syllabus. Please ignore them e.g transfer of learning etc